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HEALTH
RISK
BEHAVIORS

1992

Results of Michigan's Behavioral Risk Factor Survey

Michigan Department of Public Health

Health
Risk
Behaviors
1992

Michigan Department of Public Health
Center for Health Promotion and Chronic Disease Prevention

December 1993
HP-249

Authority: Act 368 P.A. 1978
as amended

Michigan Department of Public Health
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This project was financed in part through the Behavioral Risk Factor Surveillance System grant component of a Cooperative Agreement (U58/CCU501995-05) from the U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention. The opinions, findings, and conclusions expressed in this publication do not necessarily reflect the opinions or policies of the Federal Centers for Disease Control.

One thousand copies of this report were printed. The total cost of printing was $4,000; the unit cost was $4.00.

ACKNOWLEDGMENTS

Data collection for the 1992 Michigan Behavioral Risk Factor Survey was conducted by the Gallup Organization. The authors wish to thank Elaine Christiansen, M.A., of the Gallup Organization and the staff at Gallup for their professional assistance in all aspects of the survey conduct.

The authors wish to thank Kenneth R. Wilcox, M.D., Dr.P.H., Chief, Division of Epidemiology, and George Van Amburg, M.S., M.P.H., State Registrar and Chief of the Center for Health Statistics for reviewing drafts of this report and providing insightful comments.

Special thanks go to Mary Ann Stephens of the Chronic Disease Epidemiology Section for her exemplary technical assistance on this report. We would also like to thank Barbara A. Schillo, M.A., for her assistance with the graphics.

The staff of the Chronic Disease Epidemiology Section appreciates the assistance provided to them by Michael Gay, M.A., Emma Frazier, Ph.D., and Susie Walker in the Behavioral Surveillance Branch of the Office of Surveillance and Analysis at the Centers for Disease Control and Prevention.

The authors also wish to express their gratitude to the residents of Michigan who participated in this survey.

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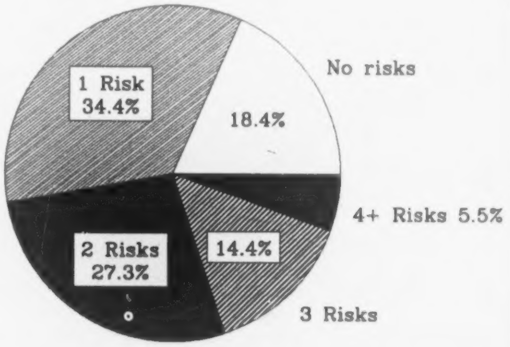
EXECUTIVE SUMMARY

This publication is the sixth in a series of annual reports on the Michigan Behavioral Risk Factor Surveillance System since 1987. The annual Michigan Behavioral Risk Factor Survey (BRFS) is a representative, state-wide telephone survey of Michigan residents 18 years and older, and currently consists of approximately 200 interviews per month which deal with key health risk behaviors. Highlights of results from the 1992 Michigan BRFS are presented below.

Cardiovascular Disease Risk Factors

Only 18.4 percent of the 1992 Michigan adult population was estimated to have none of the following risks for cardiovascular disease: cigarette smoking, high blood pressure (ever told), high cholesterol (ever told), physical inactivity (sedentary lifestyle), overweight, or diabetes (ever told). It was estimated that 5.5 percent had four or more of these risks.

Prevalence of Multiple CVD Risks
(Among: Smoking, Ever Told HBP,
Ever Told High Chol. Sedentary Lifestyle,
Overweight, and Ever Told Diabetes)

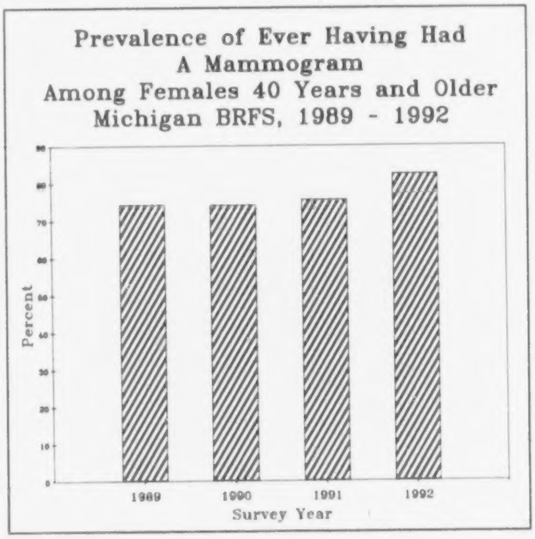


- One-quarter (25.5%) of the 1992 BRFS respondents reported that they currently smoked cigarettes and 26.8 percent reported that they formerly smoked cigarettes. Analysis of BRFS data since 1987 did not reveal any indication of a linear decline in the prevalence of smoking among Michigan adults.
- Ninety-five percent (94.8%) of the 1992 respondents reported that they had had their blood pressure checked within the previous two years, and 23.2 percent of all respondents had ever been told by a health professional that they had high blood pressure. The proportion of respondents who reported having been told that their blood pressure was high has remained approximately the same in Michigan since 1987.
- Seventy percent of respondents reported that they had had their cholesterol checked. The proportion of respondents who reported never having had their cholesterol checked has decreased 12.4 percentage points since 1988. In 1992, 26.8 percent of those who reported to have had their cholesterol checked had been told by a health professional that their cholesterol level was high.
- Nearly one-quarter (24.5%) of 1992 respondents reported that they had engaged in no leisure-time physical activities during the previous month, and 54.8 percent of respondents were classified as not having engaged in regular leisure-time physical activities during the previous month (three or more 20 minute sessions per week).

- Nearly thirty percent (29.2%) of the 1992 BRFS respondents were classified as being overweight. Analysis of Michigan BRFS data from 1987-1992 indicates that there has been a significant linear increase in the prevalence of overweight in Michigan; since 1987, there has been a 6.5 percentage point increase in the proportion of BRFS respondents who were overweight as defined by body mass index.

Women's Cancer Screening

- Eighty-two percent (82.4%) of women 40 years and older reported that they had had at least one mammogram, but only 59.9 percent of women in this age group reported having their last mammogram in accordance with the American Cancer Society's recommendations for screening mammography (i.e., within two years for women 40-49 years old and within one year for women 50 years and older). Between 1991 and 1992 there was a significant increase in the proportion of women 40 years and over who had ever had a mammogram, however, the proportion of women in this age group who reported having appropriate mammography screening did not significantly increase since 1991.
- Most female respondents (94.2%) reported that they had ever had a Pap test. However, approximately 17 percent of all female respondents reported that they had not had a Pap test in the previous three years.



Prevalence of Ever Having Had
A Mammogram
Among Females 40 Years and Older
Michigan BRFS, 1989 - 1992

Alcohol Use

- Based on the definition of 60 or more drinks per month, 4.7 percent of respondents were classified as heavy drinkers. Four percent (3.8%) of the respondents reported that in the previous month they had driven after perhaps having too much to drink, and 18.6 percent had consumed five or more drinks per occasion at least once in the previous month.

Injury Control

- Sixty-six percent (66.1%) of the 1992 respondents reported that they always wore their safety belt while driving or riding in a car and 18.6 percent reported that they nearly always wore their safety belt. Since 1987, there has been a 9.5 percentage point decrease in the proportion of BRFS respondents who reported that they wore their safety belts sometimes, seldom, or never.

AIDS Awareness

- Most respondents (94.5%) thought that a pregnant woman who had AIDS could give it to her baby and 42.9 percent thought that a person could get infected with AIDS from donating blood. Thirty-one percent of the respondents reported that they thought condoms were very effective in preventing getting AIDS through sexual activity. Seventy-eight percent (77.9%) reported that they would be willing to work with a person who is infected with the AIDS virus.

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I. INTRODUCTION

Harry B. McGee, M.P.H.

In 1987, a consortium of national health organizations, including all state health departments, began working on objectives to improve the nation's health. The result of this work was published in Healthy People 2000.[1] This document presents a strategy to improve the health of the United States population in the decade preceding the year 2000. An important component of this strategy is to improve lifestyles which contribute to illness, disability, and death.

The Michigan Behavioral Risk Factor Surveillance System (BRFSS) is able to monitor progress towards achieving several Healthy People 2000 objectives. Data, consistently gathered since 1987, can be used to look at trends in the prevalence of behaviors related to these objectives. This allows us not only to see where we are relative to the objectives, but to determine the direction we are taking over time.

One discouraging finding from the 1992 BRFSS concerns the objective for overweight, which is "no more than 20 percent among people aged 20 and older..." This is an objective under the categories Physical Activity and Fitness (1.2), Nutrition (2.3), Heart Disease and Stroke (15.10), and Diabetes (17.12). Michigan not only had one of the highest proportions of overweight among participating states' populations, but this proportion has significantly increased since 1987. This trend must be reversed to meet this objective, of four priority areas.

Reduction of cigarette smoking to a prevalence of no more than 15 percent among people aged 20 and older is an objective in the priority areas of Tobacco (3.4), Heart Disease and Stroke (15.12), and Cancer (16.6). Michigan needs to reduce the prevalence of smoking almost in half to realize this objective.

Much more encouraging is Michigan's performance on objectives related to screening. Objective 16.12 under Cancer is to increase to at least 95% the proportion of women aged 18 and older who have ever received a Pap test, and to at least 85% those who received a Pap test within the preceding one to three years. Michigan needs to increase these proportions by very little to reach these objectives.

Objective 16.11 is to "increase to at least 80% the proportion of women aged 40 and older who have ever received a clinical breast examination and a mammogram, and to at least 60% of those aged 50 and older who have received them within the preceding one to two years." Seventy-five (75.4) percent of Michigan women 40 years and older reported ever having had a mammogram and clinical breast exam and 61.6 percent of women aged 50 and older had had a mammogram and clinical breast exam in the preceding two years.

It is important that we maintain and improve these high rates of screening, even though the Healthy People 2000 objectives have been, or have nearly been reached. In the areas of overweight and cigarette smoking we obviously need intensified efforts to meet the objectives. The authors of this report hope it is useful to the readers for monitoring our progress toward the Healthy People 2000 objectives.

REFERENCE

[1] Healthy People 2000: National Health Promotion and Disease Prevention Objectives, HHS, Pub. No. 91 50212, 1991.

II. METHODS

Ann P. Rafferty, Ph.D.

Michigan has participated in the Behavioral Risk Factor Surveillance System (BRFSS) in conjunction with the Centers for Disease Control and Prevention (CDC), since 1982. The Michigan Department of Public Health conducted a point-in-time Behavioral Risk Factor Survey (BRFS) in 1982. The Michigan BRFS was reinitiated in October 1986 using a surveillance methodology, i.e., monthly data collection. The 1987 Michigan BRFS was conducted from October 1986 through September 1987; the 1988 BRFS was conducted from June through December 1988. Data collection has been conducted continuously on a monthly basis since then, with the annual Michigan BRFS instrument and report following the calendar year.

SAMPLING AND DATA COLLECTION

The data collection methodology of the 1992 Michigan BRFS remained consistent with the methods used in 1987-1991. A random sample of approximately 200 Michigan adults 18 years and older were selected and interviewed by telephone each month from January through December, 1992. Data collection was conducted by the Gallup Organization for the Michigan Department of Public Health and followed the Centers for Disease Control protocol.[1] Weighting and statistical analyses of these data were performed within the Chronic Disease Epidemiology Section of the Center for Health Promotion and Chronic Disease Prevention.

The core of the 1992 questionnaire was developed by the CDC. This main core included questions on: safety belt use, high blood pressure, leisure-time physical activity, cigarette smoking, alcohol consumption, preventive health practices (including routine physical checkups and blood cholesterol tests), height and weight, knowledge and attitudes about AIDS, women's cancer screening (i.e., mammography and Pap testing), and standard demographic questions. The core questionnaire was used by all participating states, although specific survey methodology varied among the states. Forty-eight states and the District of Columbia participated in the 1992 BRFS. States also had the option of including additional, state-specific questions to their surveys. In 1992, Michigan included a module on firearm ownership, the results of which will be reported separately.

The 1992 Michigan BRFS sampling design utilized the Waksberg random digit dialing method, which is a two-stage cluster design.[2] In the first stage, eight-digit telephone number prefixes (i.e., an area code, a three-digit prefix, and the first two digits of the last four numbers) were randomly selected from all possible eight-digit prefixes used in the state of Michigan. Each of these primary sampling units (PSU) represented one hundred potential telephone numbers. One telephone number was selected by randomly generating the last two digits to complete the number. If this first randomly selected number in the PSU was a residence, the PSU was accepted into the sample. If it was a business, institutional, or nonworking number, the PSU was rejected. In the second stage, telephone numbers continued to be randomly selected for each accepted PSU. If the number was residential, it was accepted into the sample cluster of telephone numbers from that PSU. If not residential, it would be rejected and another telephone number would be randomly selected from the same PSU. This process continued for each PSU until a cluster size of three was reached. When a residential number was successfully reached, the household occupants were enumerated and one household member 18 years or older was randomly selected using the Kish respondent selection procedure.[3]

WEIGHTING AND DATA ANALYSIS

Weights were calculated for the BRFS data so the results from the survey could be generalized to the population of Michigan. The initial unadjusted weight used was the inverse of the selection probability (or multiple thereof), i.e., the number of adults in the household, times the reciprocal of the number of phone lines into the household, times the ratio of the expected number of records in the cluster divided by the actual cluster size. This initial weight was then adjusted with a post-stratification factor using the 1990 census Michigan population estimates by age, sex, and race.[4] The final working sample size was 2413.

Data management and risk factor categorizations were performed using SPSS. Calculations of the prevalence figures and confidence interval limits were performed using SUDAAN, a statistical computing program that was designed for analyzing data from multistage sample surveys.[5]

All results presented in this report are weighted, unless otherwise specified. In the calculation of percentages of the population considered "at risk" due to the surveyed behaviors, respondents who answered that they did not know or refused to answer were not included. Because of this approach to item nonresponse, when the results of the survey are generalized to the population of Michigan, the assumption was implicitly made that the proportion of respondents at risk was the same for those with missing information as for those with adequate information.

The same approach was taken with the sociodemographic variables used for the cross-classifications shown in many of the tables. Those records with missing demographic information for that particular cross-classification were not included, but they were included in the cross-classifications for which there was sufficient information and in the totals. Sample size, therefore, may vary from question to question.

Proportions of respondents who reported risk behaviors are presented in this report by categories of age, sex, race, education, and income. The age, sex, race, and educational attainment referred to the respondent. The categories of income, however, reflected the reported annual income in the household from all sources, regardless of the respondent's income and the number of individuals in the household.

Two statistics were used to evaluate observed differences. A chi-square test was used to test overall independence within two-way tables (with a significance level of p=.05). When comparisons were made between two proportions within a two-way table, significance was noted when the difference between the proportions in question plus or minus its 95 percent confidence interval did not include zero.[a]

Although statistically significant differences were noted in this report for emphasis, the nature of these analyses remained descriptive. There may be instances in which the risk factor prevalence was in fact truly different between groups but where there was insufficient statistical power to detect these differences. On the other hand, some differences that were noted to be statistically different may in fact have been due simply to chance. It would be expected with a large number of comparisons, as were made in these analyses, that one out of every 20 comparisons could result in a statistically significant difference due to chance alone, at the p=.05 level.

SAMPLE DESCRIPTION

The unweighted and weighted sample proportions by age, sex, and race groups, along with 1990 population estimates are presented in Table II.1. A comparison of the weighted and unweighted proportions revealed that the unweighted data appeared to underrepresent 18-24 years olds and, to a lesser extent, overrepresent those 65-74 years old and 75 years and older. Males also tended to be underrepresented in the unweighted data in comparison to females.

An additional sociodemographic description of the 1992 BRFS sample is presented in Table II.2. The largest differences between unweighted and weighted percentages occurred within the marital status breakdown, in which the unweighted sample appeared to underrepresent the married group and overrepresent the divorced, widowed, or separated group. The only variable with a notable percentage of records with missing information was household income, with 6.8 percent reporting that they either did not know the income in their household or refused to answer the question.

LIMITATIONS

Telephone interviewing has been shown to be a valid method for collecting data and to be cost-effective relative to mail and face-to-face interview approaches.[6,7] Disadvantages of telephone surveys include the nonresponse among those households and eligible respondents who are difficult to reach by telephone and the lack of coverage of that portion of the population who live in households without telephones. (Approximately five percent of Michigan households do not have telephones.) These limitations could lead to biased population estimates of risk behavior prevalence rates if the rates among those living in non-telephone households and the hard-to-reach segments of the population were different from those living in telephone households and those who were easier to reach by phone. To the extent that responses, i.e., risk factors, are

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[a] The 95 percent confidence interval was calculated as the square root of the sum of squares of the 95 percent confidence intervals of the two proportions being compared. In doing these comparisons, the covariance term was assumed to be either 0, which would result in an appropriate 95 percent confidence interval of the difference, or greater than 0, which would result in an overestimate of the true confidence interval. It is thought that near 0 or positive covariance terms would be likely because of the small cluster size and the underlying assumption that demographic subgroups would be likely to have similar behavioral risk characteristics within clusters.

TABLE II.1

Comparison of the 1992 BRFS Sample (Weighted and Unweighted)
And Michigan 1990 Population Estimates (18 years and older)
By Age, Race, and Sex
(in percent)

Demographic Characteristics	Unweighted Sample	Weighted Sample[1]	1990 Population Estimates[2]
Age			
18-24	11.1	14.8	14.8
25-34	22.5	23.1	23.1
35-44	21.0	20.1	20.5
45-54	14.1	13.9	13.8
55-64	11.9	11.7	11.6
65-74	12.4	11.1	9.6
75 and Over	6.7	5.1	6.6
Missing	0.3	0.2	
Sex			
Male	43.0	47.6	47.6
Female	57.0	52.4	52.4
Race			
White	85.8	85.6	85.6
African-American	12.0	12.7	12.8
Other	2.1	1.6	1.6
Missing	0.1	0.1	

[1] Weighted by the number of adults in the household, the reciprocal of the number of phone lines into the house, the ratio of expected-to-actual cluster size, and conditionally to 1990 Michigan population estimates by age, sex and race.
[2] Source: Office of the State Registrar and Center for Health Statistics, Michigan Department of Public Health.

associated with the gender, race, and age of the underrepresented groups, the potential biases due to unit nonresponse will be at least partially corrected by the post-stratification weighting factor.

Overall the disadvantages of the telephone survey methodology are thought to be outweighed by the advantages of the telephone survey methodology, which include the quality control over data collection made possible by a computer-assisted-telephone-interviewing system, cost efficiency, and the speed at which data can be collected.[8,9]

Another potential source of bias results from the self-reported nature of these data. It would be expected that respondents might tend to underreport health risk behaviors, and especially those risk behaviors that are illegal or socially unacceptable. Significant positive biases have been documented in the self-reporting of seat belt use.[10] Self-reporting biases have also been

TABLE II.2

Demographic Description of the 1992 Michigan BRFS Sample

(in percent)

Demographic Characteristics	Unweighted Sample	Weighted Sample[1]
Education		
< High School Grad	14.6	14.3
High School Graduate	36.9	37.6
Some College	25.7	26.7
College Graduate	22.7	21.3
Missing	0.1	0.1
Income		
<$10,000	14.1	12.5
$10,000-19,999	19.3	18.5
$20,000-34,999	24.2	23.8
$35,000-50,000	17.2	18.1
>$50,000	18.0	20.3
Missing	7.2	6.8
Employment Status		
Employed	51.5	53.2
Self-employed	7.4	7.4
Unemployed	5.9	6.0
Homemaker	10.3	10.1
Student	4.1	5.0
Retired	20.6	18.0
Missing	0.2	0.3
Marital Status		
Married	52.9	59.1
Divorced/Widowed/Sep.	26.0	17.7
Never married	19.3	21.1
Unmarried couple	1.7	2.0
Missing	0.1	0.1

[1] Weighted by the number of adults in the household, the reciprocal of the number of phone lines into the house, the ratio of expected to actual cluster size, and conditionally to 1990 Michigan population estimates by age, sex and race.

documented for height and weight, the magnitude and direction of which appear to vary with gender, age, and relative weight status.[11] The importance and magnitude of self-reporting biases vary by specific health risk, and will be discussed, where appropriate, in the chapters that follow.

The total number of calls made for the 1992 BRFS was 7887. The disposition breakdown for calls was as follows: completed interview 2413; refused interview 588; non-working number 2122; ring no answer 1145; business phone 814; no eligible respondent at number 47; no eligible respondent reached 579; language barrier 36; interview terminated 64; line busy 36; respondent unable to respond due to mental or physical impairment 43. For the 1992 Michigan BRFS, the CASRO (Council of American Survey Research Organizations) response rate,[1] which includes a portion of the dispositions with unknown eligibility in the denominator of the rate, was 57.4 percent. The upper bound, which is a completion rate only among eligible respondents who were reached, was 79.3 percent.

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III. HIGH BLOOD CHOLESTEROL

Velma J. Theisen, M.S.N., R.N., C.S.; Ann P. Rafferty, Ph.D.

BACKGROUND

High blood cholesterol is defined as a total cholesterol of 240 milligrams/deciliter (mg/dL) or greater, however, a blood cholesterol above 200 mg/dL has been shown to increase the risk of developing heart and blood vessel disease.[1] Cholesterol is needed within the body and is comprised of different components. One component of blood cholesterol is HDL-cholesterol (high density lipoprotein-cholesterol). A higher level of this type of cholesterol is considered to be beneficial. Increasing evidence of an association between low HDL levels and heart disease risk prompted the National Cholesterol Education Program (NCEP) in 1993 to recommend HDL assessment along with total cholesterol. HDL levels below 35 mg/dL are classified as high risk.[1] Elevated levels of a second component, LDL-cholesterol (low-density lipoprotein-cholesterol), is considered deleterious. LDL-cholesterol is classified as desirable if it is less than 130 mg/dL. Borderline-high risk is defined as 130-159 mg/dL and high risk as 160 mg/dL or higher.

Studies have documented an association between elevated levels of blood cholesterol, development of atherosclerosis and heart disease risk, risk increases directly as blood cholesterol level increases. Although cholesterol is an independent risk factor, risk dramatically increases when elevated blood cholesterol is found in combination with smoking and/or high blood pressure.[2,3,4] Adults with high blood cholesterol are twice as likely to have heart disease as those with normal blood cholesterol levels (below 200 mg/dL), and adults with all three of the major risk factors (high blood pressure, cigarette smoking, and high blood cholesterol) have eight times the risk of an individual with none of these risk factors[4,5]

Clinical studies have identified the benefits of and the effective methods for lowering blood cholesterol. The Cholesterol Lowering Atherosclerosis Study demonstrated that the progression of atherosclerosis can be reversed.[6] Effective dietary interventions have been demonstrated which reduce blood cholesterol levels by 10 percent.[7] There is a growing body of evidence demonstrating that individuals with elevated cholesterol levels can reduce their risk of heart disease by lowering their serum cholesterol, and that a one percent reduction of elevated cholesterol results in a two percent decline in the risk of heart disease death.[8]

Treatment of high blood cholesterol consists of dietary intervention, a regular exercise program, modification of associated risk factors such as cigarette smoking or high blood pressure, and if needed, pharmacologic intervention. In most cases, it is advised that nonpharmacologic therapy be tried for 6 months before pharmacologic intervention is recommended.[1] Diet therapy focuses on reducing intake of saturated fatty acids and cholesterol, and promoting weight loss in overweight patients by reducing total calories and increasing physical activity. Pharmacologic intervention decisions are guided by LDL-cholesterol levels and patient history.[1]

The latest recommendations from the NCEP have placed increased emphasis on risk of elevated cholesterol in women and older adults. Post-menopausal women who are not taking hormone replacement therapy are at a significant risk for heart disease. These recommendations encourage cholesterol-lowering treatment of both high risk elderly and women.[1]

The initial message of the NCEP in 1985 urged the public to have their blood cholesterol level checked, to know their "number," and if high, to take appropriate action to lower it.[9] For healthy adults with blood cholesterol levels below 200 mg/dL and who have no heart disease conditions or CVD risk factors, the Cardiovascular Disease Subcommittee of the Michigan Department of Public Health's Chronic Disease Advisory Committee has recommended that blood cholesterol be checked every three years.[10] Other individuals should have their cholesterol levels checked more frequently, per the advice of their physician.

The Year 2000 Health Objectives for the Nation, as reported in Healthy People 2000, reflect the following objectives for controlling high blood cholesterol: 1) to increase to at least 60 percent, the proportion of adults with high blood cholesterol who are aware of their condition and are taking action to reduce their cholesterol to recommended levels, 2) to reduce the prevalence of high blood cholesterol levels (240 mg/dL or greater) to no more than 20 percent of adults, 3) to reduce the mean blood cholesterol level for adults to no more than 200 mg/dL, and 4) to reduce dietary fat intake to an average of 30 percent of calories or less and saturated fat intake to an average of 10 percent of calories among people aged two years and older.[11]

CURRENT FINDINGS

The 1992 BRFS results indicated that the majority of respondents who reported ever having had their cholesterol checked, had it done within the previous year (76.7%); an additional 14.0 percent had it checked within two years, 7.6 percent within five years, and only 1.7 percent had their cholesterol checked more than five years prior to the survey. Therefore, the proportions of respondents who had ever had their cholesterol checked and those who had had it checked within the previous five years were very similar at 70.3 and 69.1 percent, respectively. The prevalence rates of blood cholesterol ever having been checked and having been checked within the previous five years remained similar across all of the demographic characteristics presented in Table III.1. In the results presentation that follows, only the "ever checked" prevalence will be discussed.

The other cholesterol status indicator for which prevalence rates are presented is the proportion of respondents who had ever been told by a health professional that their cholesterol was high (Table III.1). Of those respondents who reported having had their cholesterol checked, 26.8 percent reported they had been told by a doctor or other health professional that their blood cholesterol was high; this represented 18.6 percent of all respondents.

The prevalence of both cholesterol indicators (i.e., "ever checked" and "told high") showed direct relationships with age. The proportions of respondents who had ever had their cholesterol checked increased with increasing age, from 40.6 percent among 18-24 year olds to 88.7 percent

TABLE III.1

Cholesterol Status by Demographic Characteristics
Michigan Adults, 1992
(in percentages, with 95% confidence interval limits)

Demographic Characteristics	Checked Within 5 yrs.		Ever Checked		Told High[1] (% of ever checked)	
Total	69.1	(±2.2)	70.3	(±2.1)	26.8	(±2.3)
Age						
18-24	40.0	(±6.6)	40.6	(±6.6)	8.9	(±5.4)
25-34	54.3	(±4.7)	55.7	(±4.7)	16.3	(±4.4)
35-44	71.8	(±4.4)	73.5	(±4.3)	22.7	(±4.5)
45-54	84.6	(±4.3)	86.5	(±4.0)	29.4	(±5.8)
55-64	88.1	(±4.1)	88.7	(±4.0)	36.0	(±6.2)
65-74	88.0	(±4.4)	88.7	(±4.4)	42.8	(±6.3)
75 and Older	80.9	(±6.6)	83.9	(±6.0)	31.9	(±8.3)
Gender						
Male	66.4	(±3.2)	67.9	(±3.2)	26.4	(±3.5)
Female	71.5	(±2.8)	72.4	(±2.7)	27.0	(±3.0)
Race						
White	69.1	(±2.3)	70.4	(±2.3)	27.5	(±2.5)
African-American	69.3	(±6.2)	70.0	(±6.2)	21.9	(±6.8)
Education						
Less than H.S.	63.5	(±5.9)	65.0	(±5.9)	31.1	(±6.2)
H.S. Graduate	65.0	(±3.5)	66.0	(±3.5)	27.6	(±3.9)
Some College	68.4	(±4.3)	69.3	(±4.3)	23.8	(±4.2)
College Graduate	80.7	(±3.6)	82.5	(±3.4)	26.7	(±4.4)
Income						
< $10,000	62.0	(±6.0)	64.3	(±5.8)	30.7	(±6.8)
$10,000 - $19,999	61.9	(±5.1)	63.3	(±5.1)	28.0	(±5.4)
$20,000 - $35,000	66.1	(±4.3)	67.1	(±4.3)	26.1	(±4.7)
$35,001 - $50,000	69.3	(±4.9)	70.2	(±4.9)	26.3	(±5.3)
> $50,000	81.8	(±4.0)	83.1	(±3.8)	23.9	(±4.7)

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[1] Proportion among those who reported ever having had their cholesterol checked who responded "yes" to the question: "Have you ever been told by a doctor or other health professional that your blood cholesterol is high?"

of those 55-74 year olds. Of those who had their cholesterol checked, the proportion who had been told that their cholesterol was high increased significantly from 8.9 percent among 18-24 year olds to 42.8 percent among 65-74 year olds.

Significantly more females reported in 1992 ever having had their cholesterol checked (72.4%) than males (67.9%). Among those who had their cholesterol checked, similar proportions of males and females reported that they had been told their cholesterol was high. There were no significant differences by race for either the "ever checked" or the "told high" cholesterol status indicator.

Significant differences were found among the proportions of respondents who had ever had their cholesterol checked by categories of both education and income. The proportions who had their cholesterol checked in the highest educational and income categories were significantly higher than those in any other of the respective educational/income groups. However, among those who had their cholesterol checked, there appeared to be no significant differences in the proportions of respondents reporting to have been told that their cholesterol was high by education or income.

Seventy-eight percent of those who had their cholesterol checked, reported they had been told their cholesterol level in numbers, and 67.9 percent of those were able to report their level. This represented 53.8 and 36.1 percent of all respondents, respectively.

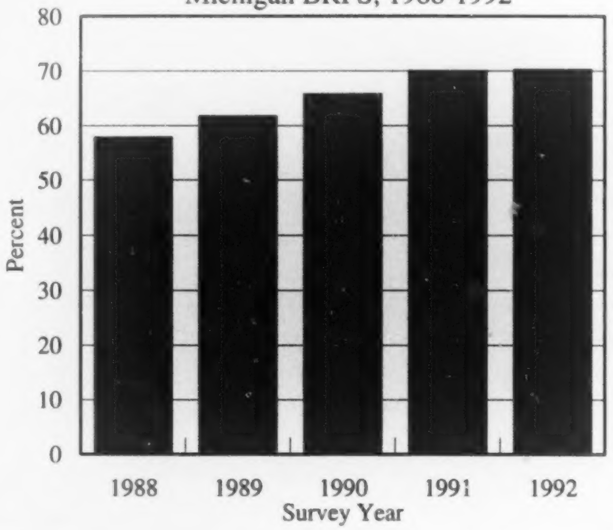
TRENDS AND COMPARISONS

Results from the Michigan BRFS have indicated that the proportion of people who have had their cholesterol checked is increasing, with 57.9 percent of the 1988 BRFS respondents having had their blood cholesterol checked,[12] 61.8 percent of the 1989 respondents,[13] 65.8 percent of the 1990 respondents,[14] 70.1 percent in 1991,[15] and 70.3 percent in 1992 (Figure III.1). These Michigan results showed consistent trends with the findings from three national Cholesterol Awareness Surveys (1983, 1986 and 1990) which also indicated continued positive changes in the public's knowledge and awareness about cholesterol and associated health behaviors.[16] Results from the Cholesterol Awareness Survey indicated that in 1983, only 35 percent of the U.S. adult population had had their blood cholesterol checked; by 1990, this proportion had risen to 65 percent.

In contrast to the proportion "ever tested", results from the Michigan BRFS have indicated little overall change, since 1988, in the proportion of those individuals who had been told their blood cholesterol was high (26.9% ±2.6 in 1988,[12] 28.8% ±2.7 in 1989,[13] 27.0% ±2.3 in 1990,[14] 31.5% ±2.4 in 1991,[15] and 26.8% ±2.3 in 1992) (Figure III.2).

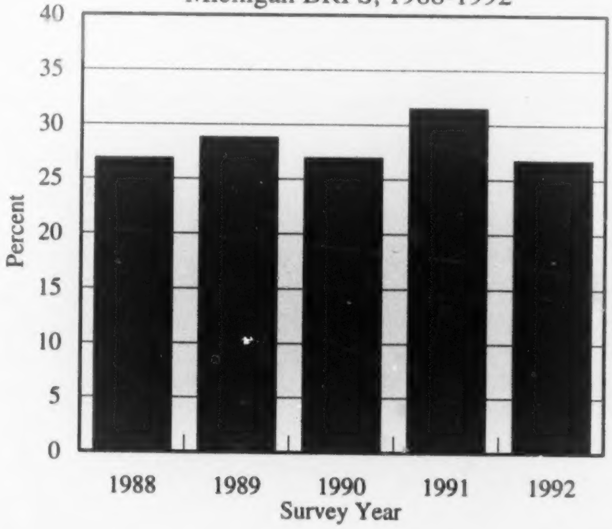
In contrast, on the national level, clinical measurements obtained from the National Health and Nutrition Examination Surveys (NHANES) II and III indicated that the proportion of U.S. adults with high blood cholesterol fell from 26 percent (NHANES II, 1976-80) to 20 percent (NHANES III, 1988-91) and desirable levels rose from 44 percent to 49 percent. NHANES results also indicated that mean cholesterol level has decreased during this time period from 213 in NHANES II to 205 mg/dL in NHANES III. The average cholesterol level has declined in all age-sex groups with no change in HDL or LDL-cholesterol. NHANES III results indicated that 52 million Americans (29%) need dietary therapy for high blood cholesterol as compared to 36 percent in NHANES II.[17] These data from the NHANES cannot be directly compared to data from the BRFS due to differences between the two surveys with regard to the indicators (ever vs. current), the measurement methodology (self-reported vs. clinical measurement), and perhaps differences between trends in the U.S. as a whole and in Michigan.

Figure III.1
Prevalence of Ever Having Had Cholesterol Checked
Michigan BRFS, 1988-1992



The 1992 prevalence in Michigan (70.3%) of ever having one's cholesterol checked was slightly higher than the median prevalence (67.3%) of all of the 48 states and the District of Columbia participating in the 1992 BRFSS. The range for this prevalence among all participating states was 59.4 to 73.7 percent. The proportion of all respondents in Michigan who had been told by a health professional that their cholesterol level was high (18.6%) was also slightly above the median proportion for all of the participating states (median 18.2%; range 14.4% - 21.5%).[18,19]

Figure III.2
Prevalence of High Cholesterol Among Those Who Had Had It Checked
Michigan BRFS, 1988-1992



COMMENT

Continued progress has been made in Michigan, and in the nation, to raise awareness and understanding about high blood cholesterol as a risk factor for heart disease and about the benefits of lowering blood cholesterol levels as a means of preventing heart disease. The first step in lowering cholesterol levels is for all adults to have their blood cholesterol checked thereby identifying those at risk. Michigan is making excellent progress in this area. Unfortunately the progress has not been made in all population groups. The results of the 1992 Michigan BRFS indicate that there were still several groups with lower rates of screening. Therefore, these groups, males, younger persons, and persons with fewer years of formal education or living in households with lower annual incomes, should be targeted for cholesterol screening. A second step is to educate the population as a whole and those at-risk, to modify their behaviors and reduce their cholesterol level.

With the progress in average cholesterol (206 mg/dL) noted in the NHANES III survey, it is possible that the national goal of having an average total cholesterol of 200 mg/dL may be reached by the year 2000. Furthermore, the Year 2000 Objective of reducing the prevalence of high blood cholesterol to no more than 20 percent of adults, has already been achieved, based on the NHANES results.[17]

To meet the ongoing challenge of reducing and controlling high blood cholesterol, comprehensive, multiple risk reduction strategies are being implemented in communities throughout this state in the Worksite and Community Health Promotion (WCHP) Program. This program is based on past experience with the Michigan Health Initiative Program, the Hypertension Control Program and national demonstration projects focusing on community risk reduction strategies. WCHP Programs, focusing on CVD risk reduction services, have been implemented in all local health departments in the state of Michigan.

Dietary intervention, focusing on weight control and fat modification, is the foundation of successful cholesterol control programs. If we are to reach all population groups, educational dietary strategies must be developed that are simple, appropriate, and culturally sensitive. Recent changes in the food labeling regulations will enhance our effort to have informed food purchasers and consumers. Programs focusing on children and youth heart-health must also be emphasized if future heart disease is to be reduced. Continual monitoring of change in risk factor awareness and control is essential and the BRFS will be an important tool for this evaluation.

Recommendations for promoting cardiovascular health in Michigan have been published by a broad-based professional consensus group, the Cardiovascular Disease Subcommittee of the Chronic Disease Advisory Committee.[20] This report and its recommendations describe the unusually large burden of cardiovascular disease in Michigan and include suggestions that will stimulate an action plan designed to reduce cholesterol and premature cardiovascular disease in Michigan.

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IV. HIGH BLOOD PRESSURE

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BACKGROUND

High blood pressure, also known as hypertension, is classified as systolic blood pressure readings of 140 millimeters of mercury (mm Hg) or greater, as diastolic readings of 90 mm Hg or greater, or as taking antihypertensive medication.[1] It is estimated that 50 million Americans have high blood pressure, or one in every four adults.[1] High blood pressure is a major contributor to morbidity and mortality due to stroke, kidney failure, and heart and blood vessel disease. Mortality rates increase progressively with higher levels of systolic or diastolic blood pressure.[1] Data from the Framingham study showed that adults with uncontrolled high blood pressure were three to four times more likely to have coronary heart disease, and as much as seven times more likely to develop a stroke, than those adults with normal blood pressure.[2] Uncontrolled high blood pressure is also a major cause of end-stage renal disease. The prevalence of high blood pressure increases with age, is greater for African-Americans than for whites, and in both races is greater among less educated people. It is also more devastating in lower socioeconomic groups.[1] In youth and early middle age, men have a higher prevalence of high blood pressure than women but the reverse is true in later life.[3]

Hypertension awareness, treatment, and control rates have improved in the past two decades. Analysis of the National Health and Nutrition Examination Survey (NHANES) data from 1971-2 to 1988-91 has shown that awareness rates have improved from 51 percent to 84 percent, treatment rates have improved from 36 percent to 73 percent, and control rates have increased from 16 percent to 55 percent (using 160/95 mm Hg as the cutoff).[1]

Numerous studies have shown that lowering high blood pressure decreases morbidity and mortality from stroke and coronary heart disease, major diseases in a category called cardiovascular disease. During the last two decades age-adjusted death rates from coronary heart disease and stroke in the U.S. have fallen 50 percent and 57 percent, respectively.[1] It is theorized that these declines are a result, in part, of heightened public awareness about high blood pressure and early identification, diagnosis, follow-up, and aggressive treatment of those with high blood pressure. The results of a 1988 national public awareness survey indicated a high level of public awareness about high blood pressure; eighty-three percent of the adult population had had their blood pressure checked at some point in the preceding 12 months.[4] Results from the National Health Interview Survey in 1985 showed that ninety-two percent were aware that high blood pressure increases one's likelihood of having heart disease.[5] Between 1982 and 1985, visits to physicians for high blood pressure screening and monitoring increased 52.7 percent, during a period when visits for other reasons increased 4.8 percent.[5]

Healthy People 2000 has established as a target for blood pressure control that fifty percent of the population with high blood pressure will have their high blood pressure under control (<=140/90 mm Hg) by the year 2000.[6] Estimates in 1988-91 showed that only 21 percent of hypertensives had their blood pressure at or below the control level of 140/90 or less.[1] Additionally, Healthy People 2000 established the objective that 90 percent of those with high blood pressure should be taking action to control their blood pressure.[6] To reach these goals, all adults need to have their blood pressure checked regularly and, if it is high, they must begin appropriate treatment. Appropriate treatment may include weight reduction, increased physical activity, and moderation of dietary sodium and alcohol; pharmacologic therapy is added if these lifestyle modifications are not effective. Pharmacologic treatment has been expanded in recent years so a large number of drugs are available which are effective in lowering blood pressure.

BRFS High Blood Pressure Indicators

Two blood pressure indicators are reported here from the 1992 BRFS: 1) proportion of respondents who had had their blood pressure checked within the preceding two years, and 2) proportion of all respondents who had ever been told by a health care professional that they had high blood pressure. It is not possible to estimate the prevalence of actual current high blood pressure from the BRFS. The assumption is made in these analyses that if a person has been told at some time that their blood pressure was high that they are at greater risk of having high blood pressure (whether or not the person's actual blood pressure was currently high at the time of the telephone interview) than someone who has never been told that their blood pressure was high.

Prevalence estimates for "high blood pressure" from self-reported data, such as the BRFS, may be different from national estimates of measured high blood pressure for several reasons. The first reason is because BRFS estimates, which are calculated from self-reported data, exclude those people who are not aware that they have high blood pressure. This exclusion of the unaware group results in an under-reporting of risk. In a 1983 household hypertension survey conducted in Michigan, eight percent of the hypertensives identified in the survey were not aware of their condition.[7] Other reasons may include fluctuating definitions of what is considered by health professionals to be "high blood pressure" and transient elevations in blood pressure.

CURRENT FINDINGS

Ninety-five percent (94.8%) of all respondents reported that their blood pressure had been checked within the previous two years. This high level of recent blood pressure check was fairly consistent across the demographic groups presented in Table IV.1. No significant differences were found in the proportion of respondents who had had their blood pressure checked within two years among age, race or income groups. Significant differences were observed between gender groups and among categories of education. Females had a higher prevalence of having their blood pressure checked within two years (96.7%) than males (92.8%). Respondents who had not graduated from high school were less likely to have had their blood pressure taken within the previous two years than respondents who had at least some post-secondary education.

Twenty-three percent of all respondents reported that they had ever been told that their blood pressure was high (Table IV.1). The majority of these respondents who had been told that their blood pressure was high had been told by a doctor (95.3%), 3.6 percent had been told by a nurse,

TABLE IV.1

High Blood Pressure Risk Indicators by Demographic Characteristics
Michigan BRFS, 1992
(in percentages, with 95% confidence interval limits)

Demographic Characteristics	Checked Within 2 yrs	Ever Told High[1]
Total	94.8 (±1.0)	23.2 (±1.8)
Age		
18-24	96.4 (±2.3)	9.4 (±3.7)
25-34	94.0 (±2.2)	10.6 (±2.7)
35-44	92.6 (±2.7)	17.7 (±3.7)
45-54	97.5 (±1.8)	29.4 (±5.5)
55-64	94.4 (±2.7)	38.3 (±6.4)
65-74	95.0 (±2.8)	40.3 (±5.9)
75 and Older	96.1 (±4.1)	53.4 (±8.5)
Gender		
Male	92.8 (±3.9)	24.1 (±2.8)
Female	96.7 (±2.0)	22.4 (±2.4)
Race		
White	94.6 (±1.1)	22.7 (±5.3)
African-American	96.5 (±2.5)	28.0 (±6.3)
Education		
Less than H.S.	91.7 (±3.2)	30.5 (±5.1)
H.S. Graduate	94.0 (±1.7)	27.5 (±3.2)
Some College	96.3 (±1.7)	19.2 (±3.3)
College Graduate	96.8 (±1.5)	15.8 (±3.6)
Income		
< $10,000	94.9 (±2.5)	31.7 (±5.8)
$10,000 - $19,999	93.3 (±2.6)	27.1 (±4.3)
$20,000 - $35,000	94.3 (±2.1)	21.7 (±3.4)
$35,001 - $50,000	95.2 (±2.2)	20.0 (±4.3)
> $50,000	96.6 (±1.7)	18.0 (±3.9)

[1] Respondents who answered "yes" to the question: "Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?"

and less than one percent had been told by another type of health professional. The prevalence of ever being told that one's blood pressure was high was directly related to age, increasing from 9.4 percent among 18-24 year olds to 53.4 percent among those 75 years and older. The proportions of men and women who reported being told that they had high blood pressure were similar at 24.1 and 22.4 percent.

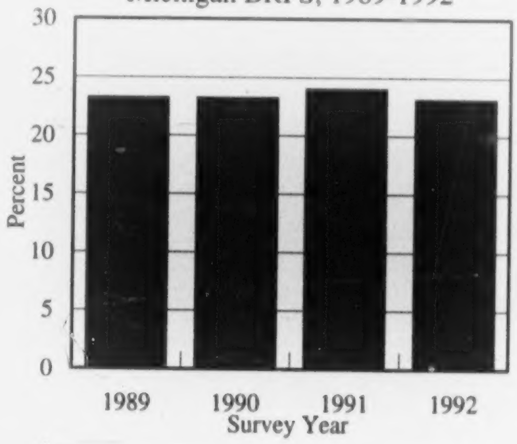
The prevalence of ever having been told that one had high blood pressure was inversely related to both education and household income status, with the prevalence being 14.7 percentage points higher among those with less than a high school education than among those with a college degree. A statistically significant difference was found between those living in households with incomes of less than $10,000 (31.7%) and those who were in the highest income category (18.0%).

Among those respondents who had been told that their blood pressure was high, most (74.6%) had been told this more than once and 61.2 percent reported that medicine was currently prescribed for their high blood pressure. These represented 17.2 percent and 14.2 percent of all respondents.

TRENDS AND COMPARISONS

The 1992 BRFS prevalence estimates for "ever told high" (23.2%) appeared low when compared to the 27.6 percent prevalence found in a 1983 Michigan household hypertension survey in which actual blood pressure measurements were taken on all survey participants,[7] and national estimates (30%).[8] The difference between these two prevalence estimates would be the result of people who were unaware that their blood pressure was high, actual changes in the prevalence of high blood pressure between 1983 and 1992, and differences in the high blood pressure risk definitions.

Figure IV.1
Proportion Who Had Ever Been Told
They Had High Blood Pressure
Michigan BRFS, 1989-1992



The prevalence of ever having been told they had high blood pressure from the 1992 Michigan BRFS (23.2%) was consistent with the previous three annual surveys (23.3% ± 2.0 in 1989[9]; 23.3% ± 1.8 in 1990[10]; and 24.1% ± 1.9 in 1991[11]), as illustrated in Figure IV.1.

Nationally it was estimated that, in 1985, 30 percent of the adult population had high blood pressure, including approximately 29 percent of whites and 38 percent of African-Americans.[8] Although there have not been statistically significant differences observed every year for the prevalence from BRFS of "ever told high blood pressure" between African-Americans and whites, the prevalence among African Americans has been consistently higher.

The proportion of respondents in Michigan who reported that they had ever been told that their blood pressure was high (23.2%) was above the median prevalence (20.7%) for all of the 48 participating states and the District of Columbia. The range among participating states was 14.7 to 27.9 percent. The proportion of respondents in Michigan who had had their blood pressure checked within two years (94.8%) was close to the median for all participating states (median 94.7%; range 90.5%-97.0%).[12]

COMMENT

Although progress has been demonstrated in hypertension awareness and detection, it is important to recognize that gaps still exist. Only one in five hypertensives have their blood pressure under good control (≤140/90). So, major emphasis is needed on strategies that will improve the control of an individual's blood pressure. Effective treatment modalities such as antihypertensive medication, weight reduction, and sodium restriction must be accessible to diagnosed hypertensives.[13] Hypertensives need adequate information and guidance to support compliance with the prescribed regimen. The inverse relationship of high blood pressure to education and income emphasizes the need for targeting high blood pressure control programs to lower income and less educated groups and for developing treatment programs that would be accessible to this population. Continued improved control of this problem requires full participation of the medical community. Anticipated health care reform holds promise to assure access of care and treatment for all individuals.

A new strategy is being promoted by the National High Blood Pressure Education Program (NHBPEP) that emphasizes primary prevention of high blood pressure.[2] This strategy is based on the idea that modest increases in blood pressure, within acceptable normal ranges, pose an increased risk of cardiovascular events. The approaches outlined in the NHBPEP recommendations include a goal to improve the average level of blood pressure in the general population, thereby reducing the probable rise of blood pressure during adulthood. This goal can be achieved by continuous, step-by-step improvement in life-styles, such as reducing prevalence of overweight, reducing average salt intake, and increasing regular physical activity.

Since research has shown a dramatically elevated risk for cardiovascular diseases from combinations of risk factors (particularly cigarette smoking, high blood cholesterol and high blood pressure) and since the majority of Michigan residents (94.8%) have had their blood pressure measured within the past two years, it is important that any blood pressure screening activity be combined with other relevant risk factor assessment, referral and follow-up services. Utilizing these screening visits for a comprehensive assessment is a cost-effective approach to controlling cardiovascular disease. Community screening programs and follow-up services, therefore, should focus on these combined risk factors to best utilize limited resources and reduce cardiovascular disease morbidity and mortality. To meet this challenge, multiple risk reduction strategies are being implemented in communities through local health departments in Michigan in the Worksite and Community Health Promotion Program. These programs will provide an important service in the mission to control blood pressure and reduce premature cardiovascular disease.

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V. CIGARETTE SMOKING

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BACKGROUND

The effects of cigarette smoking on health are well documented. Smoking is a significant risk factor for coronary heart disease, cancers (especially lung cancer), chronic obstructive pulmonary disease (including emphysema), and adverse pregnancy outcomes.[1,2,3,4,5] In 1990, tobacco was the number one contributor to mortality in the U.S., accounting for 400,000 deaths.[6] In the U.S., it is estimated that tobacco use is responsible for 87 percent of lung cancers;[5] 80 percent of mouth, throat, and esophagus cancers; and 25 to 35 percent of pancreatic, kidney, bladder, and cervical cancers.[7] A higher proportion of smoking-related cancer deaths occur among men than among women (45% vs. 21.5%).[8] However, lung cancer has now surpassed breast cancer as the leading cause of cancer deaths among women.[5] In all, tobacco use is responsible for an estimated 30 percent of all cancer deaths.[5]

Since 1965, a greater proportion of men, than women, have quit smoking.[9] Based upon current smoking and quitting patterns, it appears that lung cancer death rates among women will continue increasing well into the 21st century.[10]

There is increasing evidence that no matter how long someone has smoked, quitting reduces the risk of developing coronary heart disease,[11,12,13] lung cancer,[14] or having a stroke.[15] Two to three years after quitting, the risk of a heart attack is similar to that among those who never smoked.[16] Ten years after quitting, the risk of lung cancer is 30 to 50 percent less among those who did quit than among those who did not quit. The risk of developing lung cancer continues declining as smoking cessation continues.[14] Ten to 20 years after quitting, the risk of mortality from all causes approaches the mortality rate of never smokers.[5,13]

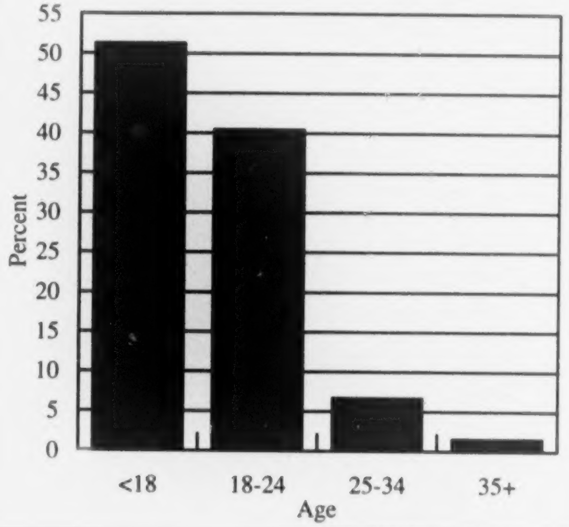
Although the risks of smoking are widely known, over a quarter (25.7%) of U.S. adults smoke.[17] About 50 percent of all smokers started smoking regularly before age 18.[5] Unfortunately, the age at which people start smoking has been declining.[5] Over seven percent (7.4%) of youth age 12-18 years smoke a whole cigarette before their 12th birthday.[18] Results from the 1991 National Youth Risk Behavior Survey (YRBS) show that 24 percent of 9th through 12th grade respondents smoked at least once in the previous 30 days. Twelve percent reported smoking on 20 of the 30 days prior to the survey.[19] In Michigan, 34.8 percent reported smoking at least once in the 30 days preceding the survey.[20] Even higher smoking prevalence has been reported by other groups of adolescents and young adults. For example, 43.3 percent of 17-18 year old high school dropouts reported smoking.[21]

CURRENT FINDINGS

Smoking Status

According to the BRFS, 25.5 percent of Michigan adults 18 years and older were current smokers in 1992; 26.8 percent were former smokers; and 47.7 percent had never been smokers, that is, they had not smoked 100 cigarettes during their lifetime. The quit ratio (the proportion of ever smokers who are former smokers) for the Michigan adult population in 1992 was 51.3 percent.

Figure V.1
Age Starting Smoking
For Ever Smokers
Michigan BRFS, 1992



The average age at which "ever smokers" (current and former smokers) started to smoke regularly was 17.9 (CI=±0.2) years. Respondents self-defined regular smoking. The majority (51.3%) of ever smokers reported that they had started to smoke regularly before age 18 (Figure V.1). Males and white respondents were more likely to report starting smoking at an earlier age (< 18 yrs).

Smoking status was found to vary significantly by gender, race, age, education, and income (Table V.1). The proportions of males and females who reported that they were current smokers in 1992 were not significantly different (males 26.1%; females 24.9%). Quit ratios, however, differed significantly by gender (males 55.4%; females 46.6%).

The prevalence of current smoking among African-Americans in 1992 (27.4%) was not significantly different than among whites (25.1%). However the quit ratio for African-Americans (39.1%) was significantly lower than for whites (53.1%). Smoking prevalence in 1992 ranged from 31.6 percent among 25-34 year olds to 7.0 percent among those age 75 years and over. Smoking prevalence decreased after age 34 as age increased. Quit ratios increased as age increased after age 34.

There was an inverse relationship between current smoking prevalence and categories of attained formal education. Smoking prevalence ranged from 31.5 percent among those with less than a high school education to 15.8 percent among college graduates. College graduates had a lower prevalence of smoking compared to every other educational group. The relationship between the quit ratio and education was also examined. Quit ratios ranged from 46.9 percent for those with less than a high school education to 64.2 percent for college graduates. College graduates reported a higher quit ratio compared to every other educational group. A relationship between household income and both smoking status (Figure V.2) and quit ratios was also observed. Generally, current smoking decreased as income increased and quit ratios increased as income increased.

TABLE V.1

Smoking Status, by Demographic Characteristics
Michigan Adults, 1992
(in percentages, with 95% confidence interval limits)

Demographic Characteristic	Smoking Status			Quit Ratio[3]
	Current[1]	Former[2]	Never	
Total	25.5 (±2.0)	26.8 (±2.0)	47.7 (±2.2)	51.3 (±3.1)
Age				
18-24	24.4 (±5.7)	10.9 (±4.0)	64.8 (±6.5)	30.9 (±9.9)
25-34	31.6 (±4.4)	18.6 (±3.5)	49.8 (±4.7)	37.1 (±6.3)
35-44	29.2 (±4.3)	28.5 (±4.2)	42.4 (±4.6)	49.4 (±6.2)
45-54	26.7 (±5.0)	32.1 (±5.5)	41.2 (±5.5)	54.6 (±7.5)
55-64	26.8 (±5.5)	39.6 (±6.0)	33.6 (±5.8)	59.7 (±7.5)
65-74	12.9 (±4.0)	40.3 (±6.3)	46.8 (±6.4)	75.8 (±7.2)
75 and Older	7.0 (±4.4)	31.2 (±7.8)	61.8 (±8.1)	81.8 (±10.8)
Gender				
Male	26.1 (±3.0)	32.4 (±3.2)	41.6 (±3.3)	55.4 (±4.5)
Female	24.9 (±2.6)	21.8 (±2.3)	53.3 (±2.9)	46.6 (±4.3)
Race				
White	25.1 (±2.1)	28.4 (±2.1)	46.6 (±2.4)	53.1 (±3.3)
African-American	27.4 (±5.5)	17.5 (±5.2)	55.1 (±6.3)	39.1 (±9.6)
Education				
Less than H.S.	31.5 (±5.4)	27.8 (±5.2)	40.7 (±5.8)	46.9 (±7.5)
H.S. Grad	27.8 (±3.3)	27.0 (±3.2)	45.2 (±3.7)	49.2 (±4.9)
Some College	26.6 (±3.9)	24.9 (±3.7)	48.5 (±4.5)	48.3 (±5.9)
College Grad	15.8 (±3.2)	28.3 (±4.1)	55.9 (±4.6)	64.2 (±6.2)
Income				
< $10,000	32.2 (±5.9)	22.6 (±5.1)	45.3 (±6.1)	41.3 (±8.3)
$10,000-19,999	28.2 (±4.7)	24.7 (±4.2)	47.1 (±5.0)	46.7 (±7.0)
$20,000-34,999	27.8 (±4.0)	26.2 (±4.0)	46.0 (±4.5)	48.5 (±6.1)
$35,000-50,000	24.7 (±4.5)	28.7 (±4.6)	46.6 (±5.1)	53.8 (±7.1)
> $50,000	17.7 (±3.8)	30.8 (±4.5)	51.5 (±5.0)	63.5 (±6.9)

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[1] Those who answered "yes" to the questions: "Do you smoke cigarettes now?" and "Have you smoked at least 100 cigarettes in your entire life?"

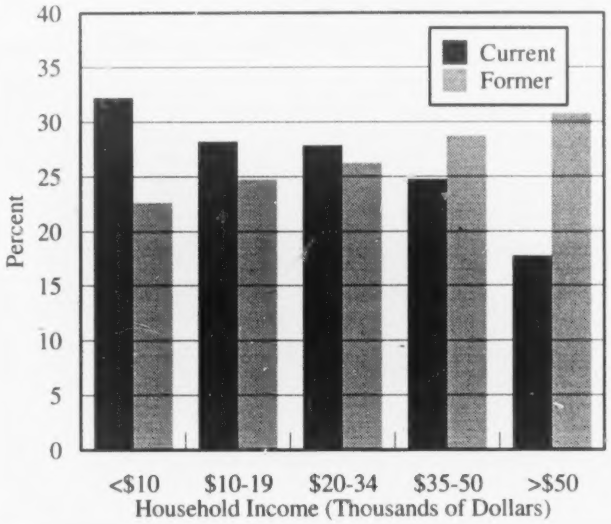
[2] Those who reported they had smoked at least 100 cigarettes in their entire life, and answered "no" to the "current smoker" question.

[3] Percent of ever smokers who are former smokers.

Amount Smoked

Among current smokers in 1992, 41.5 percent reported smoking, on average, less than one pack (1-19 cigarettes) per day, 49.7 percent reported smoking 20-39 cigarettes per day, and 8.8 percent reported smoking 40 or more cigarettes per day (Table V.2). The number of cigarettes smoked per day varied significantly by age, gender, and race. The 18-24 year age group had the lowest percentage of heavy (40+ cigarettes per day) smokers, while the 35-44 year age group had the highest percentage (Figure V.3). A significantly higher proportion of males compared to females, and of whites than African-Americans were heavy smokers.

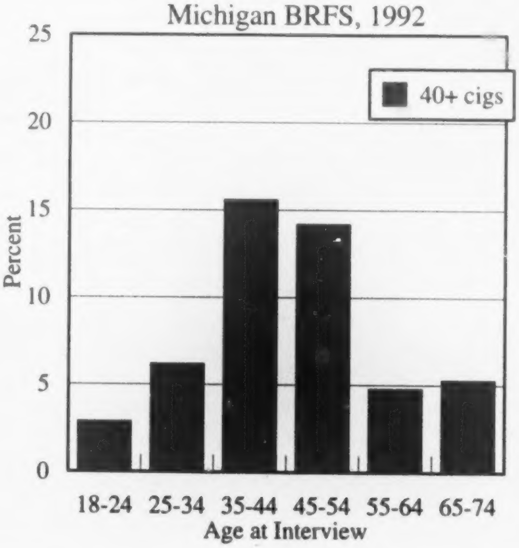
Figure V.2
Prevalence of Current and Former Smoking
By Income
Michigan BRFS, 1992



Quit Attempts

The majority (85.3%) of former smokers reported that it had been over a year since they smoked regularly. Twelve percent (12.9%) had quit within the year prior to the interview. The remaining 1.8 percent reported never smoking regularly.

Figure V.3
Proportion of Heavy Smokers
By Age
Michigan BRFS, 1992



A majority (54.3%) of current smokers reported they had quit smoking for at least one day in the previous year. A significantly higher proportion of African-Americans (77.1 %) than whites (50.2%) reported that they had quit smoking for at least one day in the previous year.

TRENDS AND COMPARISONS

Between 1982 and 1987 the smoking prevalence among Michigan adults decreased 3.5 percentage points.[22,23] However, smoking prevalence among Michigan adults remained essentially the same from 1987 to 1991 (Table

TABLE V.2

Number of Cigarettes Smoked Per Day[1]
by Demographic Characteristics
Michigan Adult Current Smokers, 1992
(in percentages, with 95% confidence interval limits)

Demographic Characteristics	Average Number Of Cigarettes Smoked Per Day					
	1-19		20-39		40+	
Total	41.5	(±4.5)	49.7	(±4.4)	8.8	(±2.4)
Age						
18-24	54.1	(±13.4)	43.1	(±13.3)	2.9	(±3.9)
25-34	41.7	(±8.1)	52.1	(±7.9)	6.2	(±3.7)
35-44	35.3	(±8.8)	49.2	(±9.0)	15.6	(±6.4)
45-54	29.9	(±10.7)	55.9	(±11.3)	14.2	(±8.1)
55-64	43.3	(±12.4)	51.9	(±12.5)	4.8	(±5.4)
65-74	60.0	(±16.0)	34.7	(±15.4)	5.3	(±7.5)
75 and Older	37.9	(±31.7)	62.2	(±31.7)	0.0	(±0.0)
Gender						
Male	34.3	(±6.3)	53.5	(±6.4)	12.2	(±4.0)
Female	48.5	(±5.9)	46.0	(±5.8)	5.5	(±2.5)
Race						
White	37.0	(±4.7)	53.0	(±4.8)	10.0	(±2.8)
African-American	68.8	(±11.2)	30.5	(±11.1)	0.1	(±1.5)
Education						
Less than H.S.	28.2	(±9.8)	58.6	(±10.5)	13.2	(±6.8)
H.S. Graduate	40.4	(±6.7)	50.4	(±6.6)	9.2	(±3.9)
Some College	47.4	(±8.6)	46.1	(±8.4)	6.5	(±4.1)
College Grad	51.0	(±11.9)	42.3	(±11.6)	6.7	(±5.7)
Income						
< $10,000	43.6	(±11.0)	50.1	(±11.2)	6.3	(±4.6)
$10,000-19,999	45.4	(±9.8)	45.6	(±10.0)	9.0	(±5.6)
$20,000-34,999	36.6	(±8.2)	52.5	(±8.5)	11.0	(±5.4)
$35,000-50,000	39.0	(±10.7)	52.5	(±10.8)	8.6	(±5.9)
> $50,000	43.1	(±12.4)	47.5	(±12.5)	9.4	(±6.4)

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[1] Reflects categorization of responses to the question: "On the average, about how many cigarettes a day do you now smoke?" This question was only asked of current smokers.

TABLE V.3
Prevalence of Smoking Among Michigan Adults
Michigan BRFS, 1982 - 1992

1982	1987	1988	1989	1990	1991	1992
32.4(±2.6)	28.9(±2.0)	26.7(±2.6)	28.3(±2.0)	29.2(±2.0)	27.9(±2.0)	25.5(±2.0)

V.3).[23,24,25,26,27] There was a statistically significant decrease in the smoking prevalence between 1990 and 1992; the 1992 prevalence estimate for smoking, however, was not significantly lower than the estimate from the 1988 BRFS, indicating a lack of consistency. Data from future surveys will be useful in determining whether this is truly the start of a decreasing trend in Michigan smoking prevalence.

The 1992 Michigan estimate of smoking prevalence, 25.5 percent, was identical to 1990 National Health Interview Survey (NHIS) estimates for the U.S.[28] The 1990 NHIS midwest regional estimate, 27.4 percent,[28] was similar to Michigan's 1991 prevalence estimate.[27] The estimated smoking prevalence among adults 20 years and older in Michigan from the September 1992 Current Population Survey was 27.1 percent.[29]

Among the states participating in the BRFSS since 1987, Michigan has reported one of the highest smoking rates.[30,31,32,33,34,35] Forty-eight states and the District of Columbia participated in the 1992 BRFSS. The median smoking prevalence reported by the BRFSS was 22.9 percent. Smoking prevalence ranged from 15.7 to 30.7 percent.[34] Similar to prior years, the 1992 current smoking prevalence in Michigan continues to be above the BRFSS median prevalence.

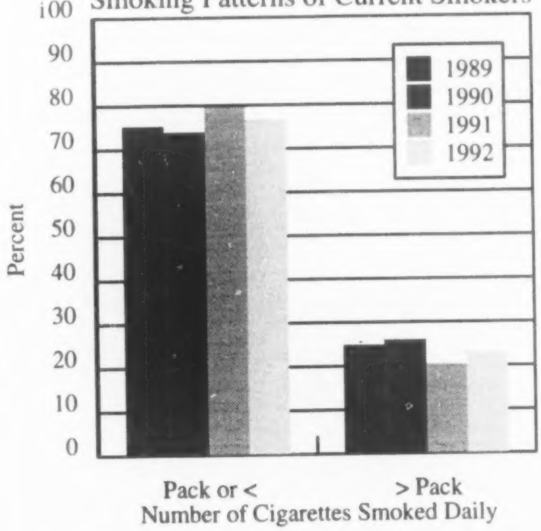
COMMENT

Nationally, smoking prevalence declined steadily from 1965 to 1990 but did not show further decline in 1991.[17,30,36,37] Michigan BRFS estimates of current adult smoking, however, remained relatively stable from 1987 to 1991 but have shown an indication of some decline in 1992.

Some suggest that smoking patterns of current smokers may be influenced by the availability of discount cigarettes.[38] Smoking patterns also may be influenced by increases in cigarette advertising and promotion expenditures. Increased unemployment and the economic uncertainty associated with lower wages and lower family incomes may influence smoking patterns, as well. Between 1990 and 1991, daily cigarette consumption decreased, as evidenced by an increase in persons smoking one pack or less and a decrease in persons smoking more than one pack (Figure V.4). A continued decrease in daily cigarette consumption, however, was not evident in 1992.

Historically, U.S. smoking prevalence has been higher among men.[35] While this has also been true in Michigan, smoking prevalence among Michigan women has been higher than national rates,[17,30,36] and remained relatively stable since 1988. Consequently, the gap between Michigan male and female current smokers has narrowed in recent years (Figure V.5).

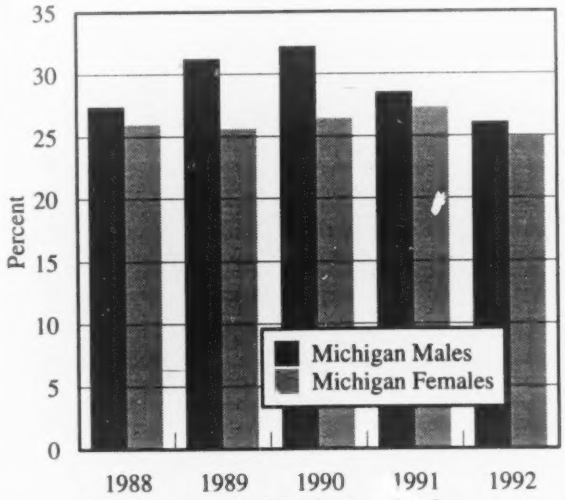
Figure V.4
Smoking Patterns of Current Smokers



Michigan's decline in smoking prevalence from 1982 to 1987 basically represented a decrease in smoking among men. Continuing this trend, significantly fewer men in Michigan smoked in 1992 than in 1989 or 1990. A greater proportion of men than women have reported quitting smoking cigarettes both nationally[13,35] and in Michigan (Figure V.6). During 1992, quit ratios increased for both men and women, however, women quit at a significantly lower rate than did men. Quit ratios were also significantly lower among women than men in 1991.[27]

Most smokers say they want to quit.[39] Many reasons, including nicotine addiction[8] and social cues influence tobacco use and explain why people continue to smoke despite their desire to quit. Tobacco advertising and promotional campaigns that glamorize smoking are designed to encourage people to begin and to continue smoking. This is especially true for advertising campaigns targeted toward youth, women, and minority persons.[40,41] During 1990, the tobacco industry spent an estimated $4 billion on advertising and promoting cigarettes in the United States.[42] The success of tobacco industry advertising and promotional tactics can be seen by the high rates of smoking among minority groups[17] and women.[43]

Figure V.5
Current Smokers by Gender
Michigan BRFS, 1992

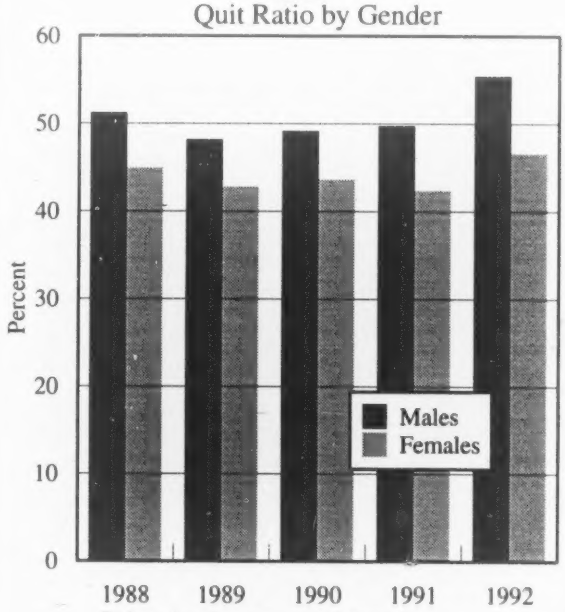


Smoking rates for Michigan males & females differed significantly during 1989 & 1990.

One of Michigan's goals for the Year 2000 is to reduce smoking prevalence to 15 percent or less among people aged 20 and older.[44] In 1992, the prevalence of current smoking among people aged 20 and older in Michigan was 25.7 percent. Therefore, to achieve this goal, Michigan must decrease smoking prevalence by 10.7 percentage points.

In its 1990 report, the Michigan Tobacco Reduction Task Force made recommendations intended to help Michigan residents achieve the Year 2000 goal for smoking.[45] The recommendations encompass the three broad areas of preventing addiction among children, encouraging cessation among current users, and protecting nonsmokers from the hazardous effects of second-hand smoke.

Figure V.6
Quit Ratio by Gender



Quit ratios for males and females differed significantly during 1991 & 1992.

Michigan's efforts to reduce tobacco use are aided by a contract from the National Cancer Institute (NCI) that began October 1991. The Michigan Department of Public Health is one of seventeen state health departments chosen to participate in NCI's American Stop Smoking Intervention Study for Cancer Prevention (ASSIST). Under ASSIST, Michigan is implementing strategies to help smokers quit and to prevent tobacco use by children.

Planning and program implementation is carried out through coalitions of community organizations. These coalitions exist at the state level and in the intensive intervention regions of Detroit, Genesee County, and the Upper Peninsula. Intervention began October 1993, and targets populations with high smoking prevalence. To reach large numbers of people, interventions involve worksites, schools, health facilities, community organizations, and the media. ASSIST will help with Michigan's tobacco reduction efforts. However, ASSIST is not a cure-all. Reducing Michigan's smoking prevalence to less than 15 percent requires an additional, substantial commitment of resources from the state, local communities, health advocates, and Michigan citizens.

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VI. OVERWEIGHT

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BACKGROUND

Overweight[a] is a significant contributor to risk for chronic disease.[1] The annual direct and indirect economic cost of overweight attributable to medical conditions, by conservative estimates, is $39.3 billion, or about 5.5% of all costs of illness in 1986 dollars.[2] In addition, Americans spend $33 billion a year on weight loss treatments.[3] The respective cost savings that could be expected due to weight loss have not yet been estimated.

The best current recommendation for reduction of chronic disease risk associated with obesity is to prevent becoming overweight. However, some research suggests that for those who are overweight even moderate weight loss (10% of body weight) does reduce the health risk of obesity.[4] Even with moderate weight loss, it is recommended that safe weight loss practices and increased exercise be encouraged.[5] Long term maintenance of weight and fat loss has been associated with exercise.[6]

Manson et al. concluded that minimum mortality probably occurs at relative weights at least 10 percent lower than U.S. average weights.[7] Increased risk of cardiovascular disease is generally recognized to be the primary relationship underlying the observed association between obesity and increased mortality.[8,9] In turn, the increased risk of cardiovascular disease is thought to be related, at least in part, to the increased risk of non-insulin-dependent diabetes,[10] lower high-density lipoprotein levels,[11] left ventricular hypertrophy,[12] and hypertension[13] associated with obesity. There is some evidence to indicate that obesity may also be an independent risk factor for cardiovascular disease.[8,14] The finding by the Hypertension Collaborative Research Group that reducing weight was the most effective strategy, compared to reducing sodium and stress management, for reducing high blood pressure in normotensive people[15] supports the role of weight reduction in overall CVD risk reduction.

Obesity has also been associated with excess rates of other conditions, such as osteoarthritis,[16] gallbladder disease,[17] and some cancers.[18] In terms of specific cancer sites, overweight and obesity have been associated with higher risks of endometrial, gallbladder, cervical, ovarian, and post-menopausal breast cancers for women;[19,20,21] and colorectal and prostate cancers for men.[18] Fat distribution in the central area of the body (android obesity) has been linked to breast and endometrial cancer in women.[22,23]

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[a] Definitions of overweight and obesity are somewhat subjective and too complex to be addressed in this chapter. The terms overweight and obesity are frequently used interchangeably by various authors and are used differently by researchers, public health professionals, and clinicians. For the purposes of discussing weight status from the Michigan BRFS data, the term overweight is used in this chapter and is defined by a body mass index at or above the 85th percentile.

The weight status of BRFS respondents was calculated using body mass index (BMI), which is defined as weight (in kilograms) divided by height (in meters) squared. BMI is one method that is used to adjust body weight for height to derive a height-free measure of weight. Weight-height indices, e.g., BMI, are often used as proxy indicators for excess body fat,[24] however, BMI may not differentiate individuals who are lean but have large body musculature.

The BMI reference standards used to categorize weight status were based on the Second National Health and Nutrition Examination Survey 1976-1980 (NHANES II) sex-specific BMI distributions for persons 20-29 years of age.[25] The rationale for this choice was that people 20-29 years old are relatively lean, i.e., closest to a population with a "healthy" body weight, and that weight gained after age 29 is predominantly fat.[26] The definition of "overweight" used in this report was a BMI greater than or equal to the 85th percentile.

Numerically, the definition of overweight for men was a BMI of 27.8 kg/m^2 or greater; for women overweight was defined as a BMI of 27.3 kg/m^2 or greater.[24] Similarly, "underweight" was defined as a BMI less than or equal to the 15th percentile (males 20.7 kg/m^2; females 19.1 kg/m^2). "Healthy weight" was then defined as weight between the 15th and the 85th percentiles of BMI.

These definitions of weight status using BMI are considered to be consistent with the 1983 Metropolitan Life Insurance Company weight-for-height criteria for which a relationship has been shown between overweight status (>120% of healthy weight) and health risks.[25] In addition, analyses of the NHANES II data showed strong associations between overweight and cardiovascular disease risk factors. The prevalence of hypertension was 2.9 times higher for overweight persons than for those not overweight; in young adults (20-44 years old) the prevalence of hypertension was 5.6 times higher than in young adults who are not overweight. In young adults who are overweight, the prevalence of hypercholesterolemia was 2.1 times that of the similar non-overweight group. The prevalence of reported diabetes was 2.9 times higher in overweight than non-overweight persons in these NHANES II data.[27]

The weight and height data used to calculate BMI and to classify the weight status of BRFS respondents were self-reported. In a reliability study using measured and self-reported height and weight data from NHANES II, it was found that on average men tended to over-report their height by .57 inches and their weight by .91 pounds; women tended to over-report their height by .23 inches and underreport their weight by 2.28 pounds.[28] In addition, misreporting of weight varied directly with relative weight status in both gender groups.[27]

One health status objective from the national Healthy People 2000 is to reduce the prevalence of overweight to no more than 20 percent among persons 20 years and older.[29]

CURRENT FINDINGS

Over one-quarter (29.2%) of the Michigan adult population was estimated to be overweight in 1992 (Table VI.1). The prevalence of overweight increased with increasing age, from 15.1 percent in the 18-24 year old group to 39.3 percent in the 45-54 year old group, after which the prevalence appeared to decrease. These apparent decreases among older age groups were not, however, statistically significant. The prevalence of overweight among African-Americans was higher (36.3%) than among whites (28.1%), and the prevalence of overweight among Michigan males (31.3%) was higher than among females (27.2%) in 1992.

Those who had not completed high school or who were high school graduates had a higher prevalence of overweight (33.8%, 34.1%) than those with some post secondary education (some college, 24.2%; college graduate, 23.8%). The prevalence of overweight was inversely related to categories of household income, with the prevalence in the lowest income category being nearly twice (40.7%) the prevalence in the highest income category (22.2%) (Table VI.1).

Thirty-eight percent (38.5%) of all respondents reported that they were trying to lose weight at the time of the interview. Among those respondents who were classified as overweight, 59.3 percent reported that they were currently trying to lose weight (Table VI.2). Among those who were not classified as overweight, nearly one-third (30.1%) reported that they were trying to lose weight. Among all respondents, middle aged persons (35-54 years old) were more likely to be trying to lose weight than persons either younger or older. Among overweight persons, those 55 years old and older were less likely to be trying to lose weight than those respondents in the two younger age groups. A significantly higher proportion of females, both overweight and not overweight, reported trying to lose weight at the time of the survey.

Among those respondents who were trying to lose weight, the majority (84.5%) reported that they were eating fewer calories. Over half (57.2%) of those trying to lose weight had increased their physical activity to lose weight. Combining these two practices, nearly half (48.0%) of those who were trying to lose weight reported that they were both eating fewer calories and increasing their physical activity in order to lose weight. Among those trying to lose weight, the proportion who reported eating fewer calories (the

FIGURE VI.1
Weight Loss Practices
Among Those Trying to Lose Weight
Michigan BRFS, 1992

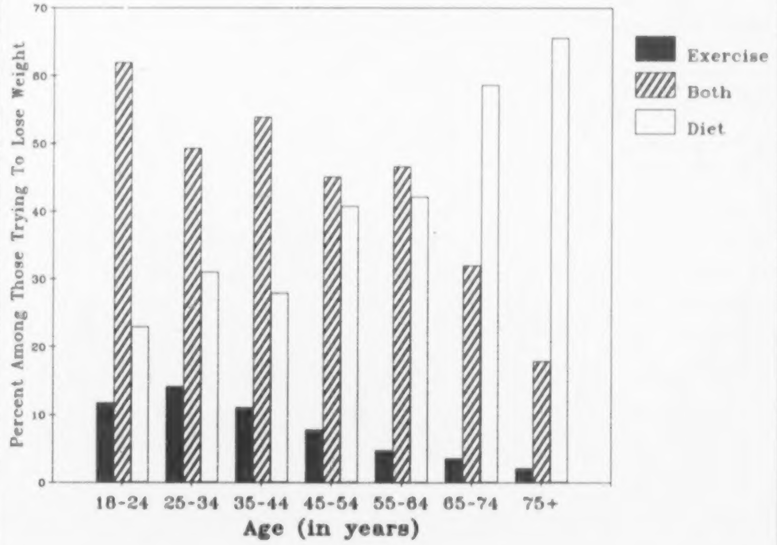

TABLE VI.1

Weight Status, by Demographic Characteristics
Michigan Adults, 1992
(in percentages, with 95% confidence interval limits)

Demographic Characteristics	Weight Status[1]		
	Overweight	Healthy Range	Underweight
Total	29.2 (±2.0)	65.8 (±2.1)	5.1 (±1.1)
Age			
18-24	15.1 (±4.7)	74.1 (±5.9)	10.8 (±4.5)
25-34	25.1 (±3.9)	68.7 (±4.2)	6.2 (±2.3)
35-44	29.3 (±4.5)	67.6 (±4.6)	3.1 (±1.8)
45-54	39.3 (±5.7)	58.0 (±5.7)	2.7 (±1.9)
55-64	35.9 (±6.2)	61.9 (±6.2)	2.2 (±1.8)
65-74	34.8 (±6.0)	61.1 (±6.1)	4.1 (±2.5)
75 and Older	32.3 (±8.4)	60.8 (±8.7)	6.9 (±4.5)
Gender			
Male	31.3 (±3.1)	63.0 (±3.3)	5.7 (±1.7)
Female	27.2 (±2.6)	68.4 (±2.7)	4.4 (±1.2)
Race			
White	28.1 (±2.1)	66.8 (±2.3)	5.1 (±1.1)
African-American	36.3 (±6.5)	58.8 (±6.3)	4.9 (±3.1)
Education			
Less than H.S.	33.8 (±5.7)	60.1 (±5.8)	6.1 (±3.1)
H.S. Graduate	34.1 (±3.5)	61.7 (±3.6)	4.2 (±1.5)
Some College	24.2 (±3.6)	70.5 (±3.8)	5.4 (±2.3)
College Grad	23.8 (±3.9)	70.8 (±4.2)	5.4 (±2.1)
Income			
< $10,000	40.7 (±6.2)	54.7 (±6.4)	4.7 (±2.4)
$10,000-19,999	33.3 (±4.9)	61.6 (±5.0)	5.1 (±2.7)
$20,000-35,000	28.4 (±3.9)	64.7 (±4.2)	6.9 (±2.5)
$35,001-50,000	28.0 (±4.8)	68.7 (±5.1)	3.3 (±2.0)
> $50,000	22.2 (±4.2)	72.7 (±4.5)	5.1 (±2.4)

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[1] Weight status categories are defined as follows: Overweight: ≥85th percentile BMI; Healthy Weight: >15th and <85th percentile BMI; Underweight: ≤15th percentile BMI. Pregnant women were excluded from this analysis.

TABLE VI.2

Proportion of Respondents Who Reported That They Were Trying To Lose Weight
For All Respondents and By Weight Status
(in percentages, with 95% confidence interval limits)

		Weight Status	
	All Respondents	Overweight	Not Overweight
Total	38.5 (±2.2)	59.3 (±4.1)	30.1 (±2.5)
Age			
18-34	35.5 (±3.5)	66.2 (±8.1)	28.0 (±3.9)
35-54	44.2 (±3.6)	62.2 (±6.2)	34.8 (±4.4)
55+	35.8 (±3.8)	50.6 (±6.9)	27.5 (±4.4)
Gender			
Males	30.4 (±3.0)	52.7 (±6.0)	20.3 (±3.2)
Females	45.9 (±2.9)	66.5 (±5.2)	38.8 (±3.5)

"diet" only plus "both" diet and exercise categories in Figure VI.1) remained consistently high across age groups. However, the proportion who were using a combination of caloric restriction and increased physical activity decreased with increasing age, primarily due to the decrease in proportion who had increased their physical activity in their attempt to lose weight.

TRENDS AND COMPARISONS

Self-reported weight and height have been consistently asked in the Michigan BRFS. The prevalence of overweight, as defined by BMI, among Michigan adults from 1987 through 1992 is presented in Figure VI.2. Overall, between 1987 and 1992, there has been a statistically significant increase of 6.5 percentage points in the prevalence of overweight. (See Table XII.3.) However, the prevalence of overweight in 1991 and 1992 were very similar, indicating that perhaps this increasing trend may have reached a plateau.

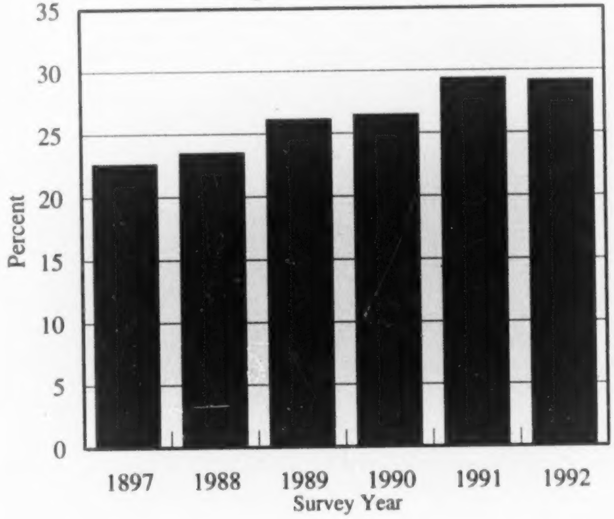
Compared to the prevalence rates found in the 48 states and the District of Columbia that participated in the 1992 BRFS, the prevalence of being overweight in Michigan (29.2%) was well above the median state-level prevalence of 24.4 percent.[30] The range for these participating states in 1992 was 17.3 to 29.7 percent. This means that Michigan was among the states participating in BRFS with the highest proportion of its population that is overweight.

Across the United States, Michigan was one of at least ten states who have been struggling with an upward trend in the percent of overweight population over the period between 1987 and 1990. These states include District of Columbia, Florida, Hawaii, Iowa, Michigan, New Mexico, Oklahoma, Rhode Island, South Carolina and Utah.[31,32,33]

COMMENT

The prevalence of overweight in Michigan, as reported in the Health Risk Behavior series, has shown a 6.5 percentage point increase since 1987. To achieve the national Year 2000 Objective of reducing the prevalence of overweight to no more than 20 percent among people aged 20 and older,[28] the prevalence of overweight among this group (currently at 29.8%) needs to be reduced by 9.2 percentage points.

Figure VI.2
Prevalence of Overweight
Michigan BRFS, 1987-1992



Considering Michigan's position in terms of chronic disease conditions related to obesity, the reduction of the prevalence of overweight has become a serious public health concern in Michigan. The Michigan Health Council has recently published guidelines[4] for adult weight loss programs in Michigan to help weight loss providers plan more effective and safe weight loss programs. Safe weight loss practices are important, because several studies have found that cycles of weight loss and gain may actually increase risk of death from cardiovascular disease.[34,35] This finding may be independent of high BMI.[34]

While increased body weight is a known risk factor for morbidity and mortality, the distribution of a person's body fat stores is very important in assessing the degree of health risk.[36] Several studies found that central or android obesity (fat deposition in the abdominal and trunk area), independent of total adiposity, has been associated with cardiovascular disease, non-insulin dependent diabetes[37], gall bladder disease[16] and breast and endometrial cancer in women.[18,19] High risk central adiposity is identified as a waist to hip ratio greater than 0.8 in women and greater than 1.0 in men. It is hoped that the Michigan Department of Public Health (MDPH) will have the opportunity to assess waist to hip ratio in the Michigan adult population after validating an indicator of this important ratio.

Changing dietary habits are consistently emphasized by The Center for Health Promotion and Chronic Disease Prevention at the MDPH to help reduce the incidence of chronic disease in Michigan. One focus of changing dietary habits is to decrease consumption of dietary fat and increase consumption of fruits, vegetables and grains. These changes are in concert with the achievement of the Year 2000 Objectives, and will help achieve and maintain healthful weight status for Michigan citizens. In part these changes can be achieved through nutrition programming at the local public health level.

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VII. PHYSICAL INACTIVITY

Karen A. Petersmarck, M.P.H., R.D.; Ann P. Rafferty, Ph.D.

BACKGROUND

Although physical activity is widely recognized to be an important protective measure against chronic disease death and disability, physical inactivity continues to be the most prevalent behavioral risk factor from the BRFS in Michigan as well as in the nation. Concern over the "epidemic of physical inactivity" prompted release of a recommendation for the public by the U.S. Centers for Disease Control and Prevention and the American College of Sports Medicine in July of 1993.[1] The recommendation is that "every American adult should accumulate 30 minutes or more of moderate intensity physical activity over the course of most days of the week."

This recommendation is based on newer studies providing strong epidemiologic evidence that burning 2,000 Calories or more per week is associated with a lower risk of death.[2] It is important to note the distinction between physical fitness and physical activity. Much of the research on health benefits of exercise has been based on levels of physical fitness. It is clear now that very significant mental and physical health benefits are realized at levels of exercise well below that required for "physical fitness,"[3] but people who achieve high levels of fitness through regular vigorous activity are certainly at low risk.[4,5] Pleasurable activities such as walking, gardening, and leisurely bicycling can make significant contributions to health. Furthermore, the previously-held belief that exercise needed to be performed for 20-30 minutes per session in order to benefit health is no longer considered valid.[6]

The role of physical activity in obesity treatment has also been more clearly delineated in the past year. Body weight and body fat losses from exercise are small and gradual,[7] but are associated with long-term maintenance of weight loss. Long-term success in weight loss is rare (75 - 95% of individuals who lose weight regain it[8]). However, it has been shown that incorporation of daily moderate intensity physical activity into an individual's permanent lifestyle has been a consistent finding among those who have been successful at maintaining weight loss for longer periods of time.[9,10] For individuals who are overweight, physical activity can improve some of the associated health risks. According to Bouchard et al., high volume, low intensity exercise on an almost daily basis, generating a substantial increase in daily energy expenditure, improves insulin sensitivity and the plasma lipid profile, and reduces blood pressure in the obese, even in the absence of weight loss.[11] The same type of endurance exercise has been associated with preferential loss of upper body fat. Upper body fat is known to be associated with higher health risk than lower body fat deposits.[11]

Physical activity has positive mental health effects. According to a recent position statement by the International Society of Sport Psychology, aerobic exercises are as effective as different forms of psychotherapy in the treatment of depression. In addition, the Society concluded that "Exercise can have beneficial emotional effects across all ages and for both sexes."[12] The body of evidence that physical activity confers substantial health benefits continues to grow. New reports in the past year suggest that physical activity is protective against hip fracture in older females,[13] loss of mobility and independence later in life,[14] and cancer death.[15]

In the Behavioral Risk Factor Survey, only leisure-time physical activity was reported. Physical activity in regular job duties was specifically excluded. This exclusion results in under-reporting of total physical activity, particularly for individuals with other than white collar jobs. Although it is true that fewer and fewer jobs involve physical activity, this potential source of bias in the data should not be overlooked.

In the telephone interview, respondents were asked whether they had participated in any physical activities or exercise during the previous month. Those who had participated were asked questions to determine the two primary types of activities and the amounts of time spent on each of them. Individuals were classified as sedentary if they did not report having participated in leisure-time physical activities at least three times a week for at least 20 minutes per session.

Two national health status objectives related to moderate physical activity from Healthy People 2000[16] are: 1) to reduce to no more than 15 percent the proportion of people 6 years and older who engage in no leisure-time physical activity, and 2) to increase to at least 30 percent the proportion of people aged 6 years and older who engage regularly, preferably daily, in light to moderate physical activity for at least 30 minutes per day.

CURRENT FINDINGS

In 1992, physical inactivity was once again the most prevalent of all behavioral risk factors among Michigan's adult population. One-quarter (24.5%) of all respondents had engaged in no leisure-time physical activities during the previous month. Fifty-five percent (54.8%) of survey respondents were classified as "sedentary" (Table VII.1).

The prevalence of physical inactivity increased with age. The proportion responding that they had not engaged in any leisure-time physical activities during the previous month ranged from 16.8 percent in the 18-24 year old group to 47.5 percent in the oldest group (75 years and older). The proportion of African-Americans who reported no leisure-time physical activities (30.8%) was significantly higher than the proportion among whites (23.5%), as was the proportion who fell into the "sedentary" category. In 1992, there were no significant differences in physical inactivity indicators by gender.

The proportion who reported no leisure-time physical activities and the proportion who fell into the sedentary lifestyle category were both inversely related to level of attained formal education and household income. The proportion who reported no leisure-time physical activities ranged from 40.2 percent among those with less than a high school education to 15.8 percent among those who graduated from college; the proportion at risk from a sedentary lifestyle ranged from

TABLE VII.1

Leisure-Time Physical Activity Status
By Demographic Characteristics
Michigan Adults, 1992
(in percentages, with 95% confidence interval limits)

Demographic Characteristics	No Activity[1]	Sedentary[2]
Total	24.5 (±1.9)	54.8(±2.3)
Age		
18-24	16.8 (±4.8)	52.6(±6.8)
25-34	24.2 (±4.0)	60.0(±4.4)
35-44	21.9 (±4.0)	51.5(±4.8)
45-54	21.9 (±5.1)	52.7(±5.9)
55-64	27.8 (±5.8)	53.2(±6.5)
65-74	29.3 (±5.5)	51.4(±6.1)
75 and Older	47.5 (±8.4)	68.6(±7.8)
Gender		
Male	23.8 (±2.9)	54.3(±3.4)
Female	25.1 (±2.5)	55.2(±2.9)
Race		
White	23.5 (±2.0)	53.6(±2.4)
African-American	30.8 (±6.5)	61.8(±6.9)
Education		
Less than H.S.	40.2 (±5.5)	66.5(±5.6)
H.S. Graduate	27.1 (±3.2)	58.4(±3.6)
Some College	19.2 (±3.5)	49.8(±4.5)
College Graduate	15.8 (±3.6)	47.1(±4.7)
Income		
< $10,000	36.2 (±5.7)	59.3(±6.3)
$10,000-$19,999	28.5 (±4.7)	56.9(±5.4)
$20,000-$35,000	24.7 (±3.9)	55.4(±4.5)
$35,001-$50,000	23.6 (±4.4)	55.5(±5.1)
> $50,000	12.0 (±3.3)	46.3(±5.3)

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[1] No leisure-time physical activities reported for the previous month.

[2] Sedentary classification was defined as those not reporting participation in leisure-time physical activities three or more times per week for a minimum of 20 minutes per session.

66.5 percent among those who had not graduated from high school to 47.1 percent among college graduates. The proportion who reported no leisure-time physical activities ranged from 36.2 percent among those who lived in households with incomes of less than $10,000 to 12.0 percent among those who fell into the highest household income category.

Walking was the most commonly reported primary leisure-time physical activity (Table VII.2). Approximately one-third (34.9%) of all respondents reported that walking had been their primary physical activity during the previous month. The next most prevalent type of exercise was some type of exercise routine, either at home or through a more formal program.

TABLE VII.2
Types of Primary and Secondary Physical Activities
(in percentages)

Activity	Proportion of All Respondents	
	Primary	Secondary
Walking	34.9	6.1
Exercises: at home routines, programs, health clubs	11.7	8.3
Gardening, yard work, snow removal	5.3	2.8
Games: basketball, softball, football, volleyball, tennis, etc.	4.3	4.4
Golf	3.9	1.8
Running, jogging	3.8	1.7
Outdoor activities: bicycling, canoeing, skiing, fishing, etc.	3.0	3.4
Swimming, water skiing, scuba diving	1.1	1.3
Other	7.5	5.7
None	24.5	64.5

TRENDS AND COMPARISONS

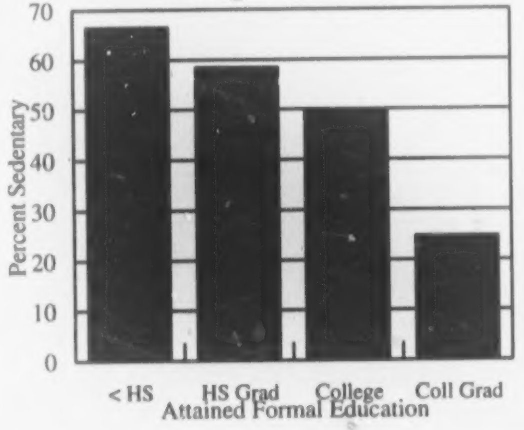
Sedentary Lifestyle

There was no significant change in the percent of adults classified as sedentary between 1991 and 1992. No consistent trend has been observed in the proportion of the population classified at risk from a sedentary lifestyle over the past 5 years. In 1988, 54.3 percent fell into the sedentary category,[17] 60.3 percent in 1989,[18] 57.4 percent in 1990,[19] 55.3 percent in 1991,[20] and 54.8 per cent in 1992.

A physical activity categorization methodology similar to the CDC method used in this report was also used in an analysis of the exercise data from the 1985 National Health Interview Survey Health Promotion and Disease Prevention Questionnaire (NHIS-HPDP). Only approximately 40 percent of the U.S. population was estimated to regularly participate in leisure-time physical activities at least three times per week for a minimum of 20 minutes per session. The 1992 BRFS estimate of 45.2 percent of the Michigan population who regularly engaged in leisure-time physical activities was close to this 1985 national figure.[21]

The inverse relationship observed in 1992 between sedentary lifestyle and education (Figure VII.1) is consistent with findings in 1988, 1989, 1990, and 1991. The consistency of this relationship across year strengthens the conclusion that education is actually associated with greater levels of leisure-time physical activity. The pattern of physical activity by education found in the Michigan BRFS was similar to that found nationally in the 1985 National Health Interview Survey (NHIS) data.[21] The pattern of low income being associated with decreased leisure-time physical activity observed in 1992 is also consistent with findings in previous years.

Figure VII.1
Proportion at Risk From Sedentary
Lifestyle, By Education
Michigan BRFS, 1992



Physical Activity in the Previous Month
In 1992, there was a significant increase in the percent of adults who reported that they had engaged in some kind of physical activity in the previous month, compared to 1991 (75.5% vs. 71.2%). Despite this encouraging increase, it is not possible to identify a consistent trend (70.9% in 1987,[22] 72.4% in 1988[16], 70.7% in 1989[17], 67.6% in 1990[18], 71.2% in 1991[19], and 75.5% in 1992).

Comparison of Michigan with Other States
Compared to the 48 states and the District of Columbia that participated in the 1992 BRFS, the prevalence of sedentary lifestyle in Michigan fell just slightly below the median for all participating states (56.5%). The range for the participating states was 46.2 to 82.1 percent. The prevalence of no leisure-time physical activity for Michigan also fell just below the median for all participating states (27.4%; range 17.1% - 48.1%).[23]

COMMENT

The "epidemic of physical inactivity" reflected in the BRFS findings undoubtedly has a negative effect on the health of the population and contributes substantially to the rising cost of health care. A number of actions could contribute to the efforts towards increasing physical activity. For example, schools could place more emphasis on enjoyable activities which can promote lifetime participation in physical activity, and perhaps de-emphasize competitive sports. Latchkey children could be offered creative programs for the after-school hours so they would have an alternative to television. Corporate policies and facilities could be developed to encourage physical activity during the workday. Communities could develop walking and biking trails. Neighborhoods that are unsafe for walking could add lighting and supervision. People with disabilities could be given access to private exercise facilities during low usage times. Communities could develop facilities for amateur sports. Parents could plan family recreation that involves physical activity. People with little leisure time can build physical activity into their work day. Creative problem-solving needs to be done at the individual and local community levels to identify and eliminate barriers to physical activity if Michigan citizens are to enjoy the health benefits of physical activity.

Efforts are underway in Michigan to increase physical activity. The new Governor's Council on Physical Fitness, Health and Sports, is establishing a nonprofit foundation to make private sector resources available for creative efforts aimed particularly at schools, worksites, and local communities. The Cardiovascular Disease Subcommittee of the Chronic Disease Advisory Committee to the Michigan Department of Public Health is focusing program efforts on inactivity among children in Michigan. The American Heart Association of Michigan is initiating a "train the trainer" program for helping people to become more active.

If the daily level of physical activity were increased among the sedentary population in Michigan, a tremendous improvement in the public health could be anticipated, with essentially no increase in health care expenditure.

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VIII. ALCOHOL USE

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BACKGROUND

Alcohol-related morbidity and mortality represent a major public health problem. Adverse social and health consequences can arise from single occasions of drinking as well as from longer term alcohol consumption. Among the health consequences of chronic and heavy alcohol consumption are nutritional deficiencies; impaired function of individual organs (i.e., liver, pancreas, and brain) as well as impairment of the gastrointestinal, cardiovascular, and endocrine systems; adverse birth outcome (including Fetal Alcohol Syndrome); depression, and other mental health effects and social negative consequences such as aggression, crime, marital discord, child abuse, and job loss.[1] Binge drinking is usually associated with negative episodic events, such as intentional (suicide, homicide) or unintentional injury (motor vehicle crashes, falls, etc.).[2,3] It has been estimated that nearly half of the traffic fatalities, in 1991, in the United States were alcohol related.[4] Two-fifths of the deaths from falls and from fires and burns, and almost four out of ten drownings have been estimated to involve alcohol.[5,6] Overall, alcohol-associated events are the second leading cause of premature death in the United States, accounting for 1.5 million years of potential life lost before the age of 65.[7]

The majority of alcohol drinkers are so-called "social drinkers" for whom drinking produces no serious long-term health or social consequences. Although these individuals do not experience the effects of chronic alcohol abuse, they may still be at risk for adverse consequences arising from single occasions of drinking, such as alcohol-related injury.[8] Patterns of heavy drinking on single occasions or within short time periods are often described as "alcohol abuse." In contrast, chronic patterns of heavy drinking are more typically viewed as "alcohol dependence" in which an individual experiences a loss of control over their use of alcohol, typically along with a variety of other life or health problems. In the United States, alcohol abuse and dependence affect more than 10 percent of the adult population.[8]

Alcohol problems are often linked to heavy drinkers only (such as, those who consume 2 or more drinks per day). However, less than 10% of the U.S. population can be classified as heavy drinkers, which indicates that "moderate" drinkers may account for well over half of all alcohol-related problems.[9,10] Alcohol-related consequences affect not only drinkers themselves, but also their family members, friends, and employers.[11] The overall social and economic costs of alcohol-related problems to families, employers, and health service facilities are enormous.[12,13,14] In 1990, the annual cost of alcohol abuse was estimated to be $99 billion nationally, of which 71 percent was attributed to loss associated with illness and death.[15]

It has been found that males and females differ in terms of their drinking patterns and level of problems.[16] Females are less likely to drink heavily and have different sets of factors, such as gender-role orientation, and risks, such as reproductive problems, associated with alcohol consumption.[16,17] Differences in alcohol use patterns and vulnerability to alcohol-related problems have also been found among major racial and ethnic groups in the United States.[18] For example in one study, overall drinking levels were found to be highest among white men but African-American men reported higher rates of drinking-related problems than white men, whether measured in medical or personal and social terms.[19]

Age is risk factor for alcohol use. Both heavy drinking and drinking-related problems are associated with being male and young, and as age increases, heavy drinking tends to decrease.[20] Although a gradual downward trend in alcohol use by high school seniors was noted during the 1980's and continued through 1992, alcohol use was still disturbingly high in 1992: 88 percent of high school seniors had tried alcohol, more than two-thirds were current drinkers and almost one-third were binge drinkers.[21,22] Young people begin alcohol use at a relatively early age. Findings from the 1992 Monitoring the Future Survey indicated that 69 percent of eighth graders and 82 percent of tenth grade students have used alcohol; 27 percent of eighth graders reported having been drunk at least once.[21]

Risk factor prevalence rates from the 1992 Michigan BRFS for three indicators of possible alcohol abuse, i.e., heavy drinking, binge drinking, and drinking and driving, are presented in this report. Each indicator is based on self-reported behavior during the month prior to the interview. Heavy drinking was defined as the consumption of sixty or more alcoholic drinks per month;[a] binge drinking was defined as having consumed five or more drinks on a single occasion at least once in the previous month; and drinking and driving was defined as one or more occasions of driving after having had "perhaps too much to drink."

CURRENT FINDINGS

Fewer than half (46.4%) of the BRFS respondents in 1992 reported drinking no alcoholic beverages during the previous month (Table VIII.1). Significant differences were observed in the proportion of abstainers by all of the demographic variables of interest. The proportion of abstainers generally increased with age, ranging from 41.4 percent of 25-34 year olds to 85.4 percent of those 75 years and over. Significantly more females reported abstaining from alcohol in the previous month (53.9%) than males (38.1%) and more African Americans abstained (61.5%) than whites (43.9%). The proportion of respondents abstaining from alcohol was inversely related to both education and household income.

The prevalence of heavy drinking (defined as 60 or more drinks per month) among all respondents was 4.7 percent (Table VIII.1); among only those who reported drinking alcohol during the previous month, the prevalence was 8.7 percent. The prevalence of heavy drinking differed significantly by gender and race. The prevalence of heavy drinking was significantly

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[a] The current definition of heavy drinking has been used since 1990. Prior to 1990 heavy drinking was defined in the Michigan BRFS as 14 or more drinks per week.

TABLE VIII.1

Drinking Status, by Demographic Characteristics
Michigan Adults, 1992
(in percent with 95% confidence interval limits)

Demographic Characteristics	Drinking Status			
	Abstainers[1]	Light[2]	Moderate[3]	Heavy[4]
Total	46.4 (±2.2)	27.4 (±2.0)	21.5 (±1.9)	4.7 (±1.0)
Age				
18-24	41.4 (±6.3)	27.5 (±5.8)	25.0 (±5.9)	6.0 (±3.5)
25-34	38.2 (±4.4)	29.4 (±4.2)	27.7 (±4.1)	4.8 (±1.9)
35-44	40.0 (±4.6)	30.7 (±4.4)	23.4 (±4.1)	6.0 (±2.3)
45-54	46.8 (±5.9)	31.1 (±5.8)	17.4 (±4.4)	4.8 (±2.5)
55-64	50.6 (±6.4)	25.1 (±5.7)	20.3 (±5.3)	4.1 (±2.4)
65-74	58.7 (±6.1)	23.1 (±5.3)	15.6 (±4.5)	2.6 (±1.8)
75 and Older	85.4 (±6.2)	10.1 (±5.3)	4.1 (±3.4)	0.5 (±0.9)
Gender				
Male	38.1 (±3.2)	25.0 (±3.1)	28.3 (±3.1)	8.7 (±1.9)
Female	53.9 (±3.0)	29.6 (±2.6)	15.5 (±2.2)	1.0 (±0.5)
Race				
White	43.9 (±2.3)	28.1 (±2.2)	22.9 (±2.1)	5.1 (±1.1)
African-American	61.5 (±6.0)	23.2 (±5.3)	13.9 (±4.4)	1.4 (±1.2)
Education				
Less than H.S.	66.0 (±5.7)	17.1 (±4.7)	9.4 (±3.4)	7.6 (±3.4)
H.S. Graduate	49.4 (±3.5)	25.5 (±3.1)	20.9 (±3.0)	4.2 (±1.5)
Some College	39.6 (±4.1)	29.5 (±3.8)	26.0 (±3.8)	4.9 (±2.0)
College Grad	36.8 (±4.5)	34.9 (±4.5)	25.1 (±4.1)	3.2 (±1.5)
Income				
< $10,000	62.3 (±6.2)	19.3 (±4.8)	14.9 (±4.7)	3.5 (±2.4)
$10,000-19,999	54.9 (±5.1)	23.8 (±4.4)	16.9 (±3.8)	4.4 (±2.2)
$20,000-35,000	47.2 (±4.4)	27.6 (±3.9)	20.4 (±3.7)	4.8 (±1.9)
$35,001-50,000	34.2 (±4.8)	32.9 (±4.9)	26.2 (±4.6)	6.7 (±2.5)
> $50,000	33.0 (±4.6)	33.7 (±4.9)	29.7 (±4.8)	3.6 (±1.9)

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[1] Includes persons who reported that they had consumed no alcoholic beverages during the past month.

[2] Persons who reported consuming an average of less than 10 drinks in the last month.

[3] Persons who reported consuming an average of between 10 and 59 drinks in the last month.

[4] Persons who reported consuming 60 or more drinks in the last month. This category also includes respondents for whom there was missing information but who responded that they had five or more drinks per occasion 12 or more times in the past month.

higher among men (8.7%) than women (1.0%), and higher among whites (5.1%) than African-Americans (1.4%) in 1992.

National dietary guidelines[23] advise one or fewer drinks per day for women and two or fewer drinks per day for men. When heavy drinking was defined as 30 or more drinks per month for women and 60 or more drinks per month for men, the estimated prevalence of heavy drinking among female respondents was 4.7 percent, and 6.6 percent among all respondents. This represented 10.3 percent of female respondents who reported drinking alcohol in the previous month and 12.3 percent of all respondents who consumed alcohol in the previous month.

Prevalence estimates for binge drinking and drinking and driving are presented in Table VIII.2. Eighteen percent (18.6%) of the respondents reported binge drinking (defined as 5 or more drinks per occasion) at least once in the previous month and 3.8 percent reported driving at least once after perhaps having had too much to drink. These prevalence rates represent 34.7 percent and 7.0 percent, respectively, of those 1992 respondents who reported consuming any alcohol in the previous month.

The prevalence rates of both binge drinking and drinking and driving were significantly higher among men than women. Binge drinking was inversely related to age; the prevalence ranged from 33.1 percent among the 18-24 year olds to approximately one percent among the oldest group of 1992 respondents. When examined by age and gender, young males (18-34 years old) emerged as a group who had the highest prevalence rates of binge drinking (40.8%).

TRENDS AND COMPARISONS

Trends in Alcohol Use from the Michigan BRFS

No significant differences were observed between 1991 and 1992 in the Michigan BRFS for any of the three alcohol indicators: heavy drinking (4.9% ±1.1% in 1991; 4.7% ±1.0% in 1992), binge drinking (18.3% ±1.9% in 1991; 18.6% ±1.8% in 1992), or drinking and driving (4.2% ±0.9% in 1991; 3.8% ±0.8%).[24] The prevalence of self reported drinking and driving has shown a clear decrease since 1987, from 7.2 percent[25] to 3.8 percent in 1992. Estimates of binge drinking in the Michigan BRFS have fluctuated across the years but also appear to be generally decreasing.[26,27,28] The prevalence of the three alcohol risk indicators have, since 1990, consistently shown associations with gender and age, i.e., younger people tended to have higher risk prevalence rates for the three alcohol indicators than older people, and males tended to have higher rates than females. Although alcohol rates among whites have tended to be significantly higher than among African-Americans, this has not been consistently observed primarily because of the small sample sizes for the African-Americans. However, in an analysis that combined three years of Michigan BRFS data (1989-1991) all three alcohol indicators showed higher prevalence rates among whites than among African-Americans.[29]

Comparisons Among States that Participated in the 1992 BRFSS

The 1992 Michigan prevalence rates of the three alcohol indicators were higher than the median prevalence rates among all of the 48 states and the District of Columbia that participated in the 1992 BRFS. The median prevalence across the states for heavy drinking was 2.9 percent (range 1.7 to 6.8 percent), for binge drinking 18.6 percent (range 5.4 to 25.8 percent), and for drinking

TABLE VIII.2
Binge Drinking, and Drinking and Driving, by Demographic Characteristics
Michigan Adults, 1992
(in percent with 95% confidence interval limits)

Demographic Characteristics	Binge Drinking[1]	Drinking and Driving[2]
Total	18.6 (±1.8)	3.8 (±0.8)
Age		
18-24	33.1 (±6.3)	5.6 (±3.0)
25-34	25.9 (±4.0)	6.3 (±2.2)
35-44	18.9 (±3.7)	4.1 (±1.7)
45-54	11.8 (±3.7)	1.1 (±1.2)
55-64	14.1 (±4.6)	3.4 (±2.5)
65-74	4.8 (±2.7)	0.9 (±1.1)
75 and Older	1.0 (±1.9)	0.0 (±0.0)
Gender		
Male	28.5 (±3.0)	5.6 (±1.5)
Female	9.6 (±1.8)	2.1 (±0.9)
Race		
White	19.7 (±2.0)	4.2 (±0.9)
African-American	11.4 (±4.1)	1.3 (±1.4)
Education		
Less than H.S.	12.9 (±3.8)	2.0 (±1.4)
H.S. Graduate	19.8 (±2.9)	3.5 (±1.3)
Some College	23.7 (±3.9)	4.8 (±1.9)
College Graduate	13.6 (±3.3)	4.2 (±1.7)
Income		
< $10,000	17.8 (±5.1)	1.8 (±1.5)
$10,000 - $19,999	16.9 (±4.0)	3.4 (±1.8)
$20,000 - $35,000	19.2 (±3.5)	4.3 (±1.8)
$35,000 - $50,000	22.3 (±4.3)	5.0 (±2.2)
> $50,000	19.5 (±4.3)	4.4 (±2.1)

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[1] Responded one or more occasions to the question: "Considering all types of alcoholic beverages, that is beer, wine and liquor as drinks, how many times during the past month did you have five or more drinks on one occasion?"
[2] Respondents who report having driven one or more times during the past month after having too much to drink.

and driving 2.3 percent (range less than 1 to 5.7 percent).[30]

Comparisons With National Data

On the national level, the 1985 National Health Interview Survey classified 13 percent of male respondents and 3 percent of female respondents as heavy drinkers.[31,b] These prevalence figures were similar to those reported for heavy drinking in Michigan from the 1987 BRFS (males 13.8%; females 3.7%).[26] Compared to the prevalence of moderate and heavy drinking combined from the 1991 National Household Survey conducted by the National Institute on Drug Abuse (NIDA), the prevalence rates from the 1992 Michigan BRFS for heavy and moderate drinking combined were consistently higher, except for African-Americans (Table VIII.3). The definition of moderate and heavy drinking used by NIDA was less stringent (1 drink or more per week) than that used in the Michigan BRFS (10 drinks or more per month). If the same definition had been used in both surveys, even larger differences might be expected. The prevalence rates of alcohol use in the previous month from the BRFS were also consistently higher than those from the NIDA survey.

TABLE VIII.3

Comparison of 1991 National Household Survey[1] and 1992 Michigan BRFS Results
(in percentages)

	Moderate and Heavy Use		Ever Used in Previous Month	
	NHS[2]	BRFS[3]	NHS	BRFS
Gender				
Males	29.4	37.0	58.1	62.0
Females	13.6	16.5	44.3	46.1
Race				
Whites	21.9	28.0	52.7	56.1
African Americans	20.2	15.3	43.7	38.5

[1] Source: NIDA National Household Survey on Drug Abuse: Population Estimates 1991, US Department of Health and Human Services, Alcohol, Drug Abuse, and Mental Health Administration, 1992. DHHS Publication No.(ADM)92-1887.
[2] Consumed an average of at least one alcoholic drink per week.
[3] Consumed an average of 10 alcoholic drinks in the previous month.

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[b] Heavy drinking was defined in the 1985 NHIS as an average of 1 oz. of ethanol consumed daily in the two weeks prior to the interview. This definition would be similar to that used in the BRFS, assuming that a typical drinks contains .5 oz. of ethanol.

Comparison to Michigan Synthetic Estimates

Synthetic prevalence estimates of alcohol abuse and dependence[c] for the 1990 Michigan adult population have been calculated by the MDPH Center for Substance Abuse Services.[d,32,33] Using this approach, it was estimated that approximately 8.2 percent of the 1990 adult Michigan population 18 years and older (or 558,486 adults) had a drinking problem, i.e., 3.2 percent with an alcohol abuse problem and 5.0 percent with an alcohol dependence problem. The 1992 BRFS estimates of heavy drinking were roughly similar to the synthetic estimates of alcohol dependence for the total adult population (4.7%, 5.0%), by gender (males 8.7%, 7.2%; females 1.0%, 2.9%), and by race (whites 5.1%, 4.7%; African-Americans 1.4%, 5.5%).[32] The similarity between the estimates from these two different sources and methods lends confidence to the use of both of these methods of estimating the prevalence of alcohol dependence in Michigan.

Comparisons to Treatment Admissions in Michigan

In the 1991/92 fiscal year there were 48,560 admissions to state-funded treatment programs in Michigan with alcohol as the primary substance of abuse.[e] Three out of four of these admissions were males. Those admitted to the state-funded treatment programs for alcohol were likely to be white (79%), single (77%), and not working (57%). Among the age groups, the highest proportion of alcohol treatment admissions came from the 26-35 year old group (39%), followed by the 36-44 year olds (22%). Nearly 2 out of 5 (38%) of those admitted had less than high school education, 42% had finished high school, and 19% had at least some college education. Compared to this demographic description of those admitted to state-funded treatment programs, a higher proportion of those respondents in the 1992 BRFS classified as heavy drinkers were male (88.5%) and white (93.1%), and a lower proportion were not married (45.6%) and had not graduated from high school (23.3%). Some of these differences between the socioeconomic characteristics among the alcohol treatment admissions to state-funded programs and among heavy drinkers from the BRFS may well reflect the fact that upper income individuals are less likely to seek treatment in these programs.

Demographic Subgroup Analyses Across Data Sources

Problem drinking was defined differently in each of these three sources of Michigan alcohol data and thus the alcohol rates (i.e., BRFS prevalence estimates of alcohol use, the synthetic estimates of alcohol abuse and dependency, and treatment admissions) from these three sources must be viewed differently. However, it is still useful and informative to compare these different sources of data for trends within demographic breakdowns.

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[c] Alcohol abuse involves a pattern of heavy alcohol intake in non-alcohol-dependent persons in which health consequences and impairment in social functioning are associated. Alcohol dependence is differentiated from alcohol abuse on the basis of such manifestations as craving, tolerance, and physical dependence that result in changes in the importance of drinking in one's life and in impairment of the ability to exercise restraint over drinking.

[d] National research studies have provided a basis for development of population projections in terms of prevalence of alcohol abuse and alcohol dependence. Application of these projection techniques to the population of Michigan necessitate an assumption that Michigan population behaves in a way similar to national populations with respect to alcohol use.

[e] The limitations of these data are that only a portion of people with an alcohol problem seek treatment within a given time period, and that a fraction of those seeking treatment are admitted to state-funded programs. (Less than half of all licensed treatment programs in Michigan received some level of state funding in FY 1990/91; non-funded programs do not routinely report data to the state.) Another limitation in comparing these data to BRFS data is that these data cover all age groups, including children.

Alcohol rates from all three data sources were consistently higher for males than for females (Figure VIII.1). This was apparently also the case within racial categories, although the prevalence of moderate and heavy alcohol use from the BRFS for African-American males (20.1% ±8.2%) was not significantly higher than for African-American females (11.4% ±5.0%). The gender gap indicated by the BRFS data was more pronounced for whites, whereas the gender gap was more pronounced for African-Americans in the synthetic estimates and the treatment data. The alcohol rates from the synthetic estimates and from the treatment data indicated that the rates for African-American males were higher than for white males. However, the BRFS alcohol use data indicated just the opposite, the rate of moderate and heavy alcohol use among white males (39.4% ±3.5%) was significantly higher than among African-American males (20.1% ±8.2%).

When the data from these three sources are presented by age within gender (Figure VIII.2), very similar patterns are exhibited by the BRFS prevalence rates and the synthetic estimates, especially for males. Rates for males from these two data sources are inversely related to age, i.e., older males have lower rates than younger males. In the BRFS data, although the alcohol use rate among females 18-29 years (20.1% ±5.3%) was significantly higher than among females 65 years and older (11.3% ±4.0%), the magnitude of this difference was not as great as among males (males 18-29 years, 45.8% ±6.9%; males 65 years and older, 17.9% ±6.3%). This difference in the magnitude of the age differential in use resulted in the gender gap being greater for younger persons in the BRFS data set than for older persons. Treatment admissions showed an entirely different pattern. Admissions rates for both males and females showed a curvilinear relationship with age and peaked for the 30-44 year old group. The under 18 age group, for which data were not available in the other data sets, showed little gender gap, whereas the 30-44 year old group showed the biggest difference between males and females.

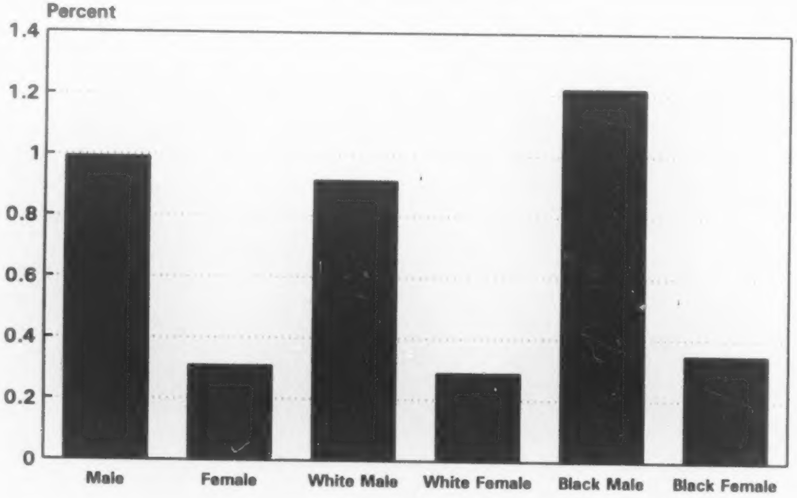
COMMENT

Drinking and driving may be declining in Michigan, with the prevalence as measured by the BRFS falling from 7.2 percent in 1987 to 3.8 percent in 1992. This trend is corroborated by Michigan State Police data which show that the proportion of alcohol-related motor vehicle fatalities in Michigan also appears to be declining, from 49.6 percent in 1986 to 44.6 percent in 1991. (Provisional 1992 data show a further decline to 38.7 percent). Despite this overall improvement, comparatively high levels of alcohol use in Michigan for drinking and driving, chronic heavy drinking, and binge drinking compared to other states that participated in the 1992 BRFSS indicate a need for further efforts aimed at reducing these behaviors which potentially lead to illness or injury.

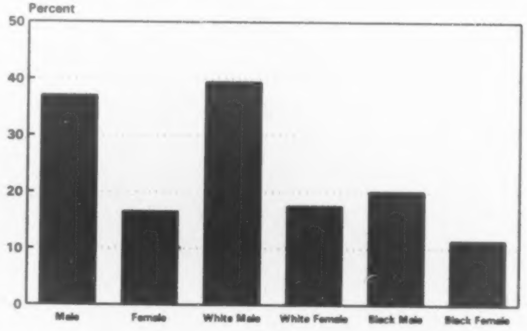
Finally, it should be recognized that alcohol use can be examined by various methods and that each method may have some level of inherent limitation. Surveys such as the BRFS and the National Household Survey provide estimates of the prevalence of alcohol use for the population as a whole. However, within the population of drinkers, determining the number and characteristics of problem drinkers can be done by using synthetic estimates and analyzing

FIGURE VIII.1: Comparisons of Three Data Sources by Gender and Race (Rates calculated as percent of total Michigan population base.)

Treatment Admission by Sex and Race
FY 1991-92



BRFS Alcohol Use by Sex and Race
FY 1992



Alcohol Dep. and Abuse by Sex and Race
1990 (Synthetic Estimate)

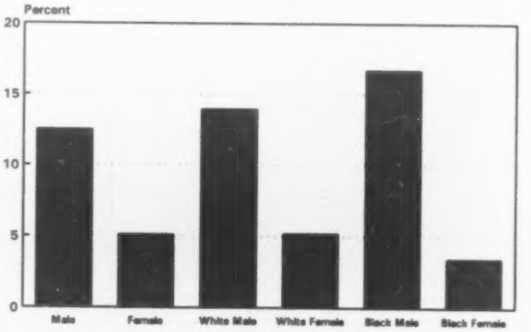
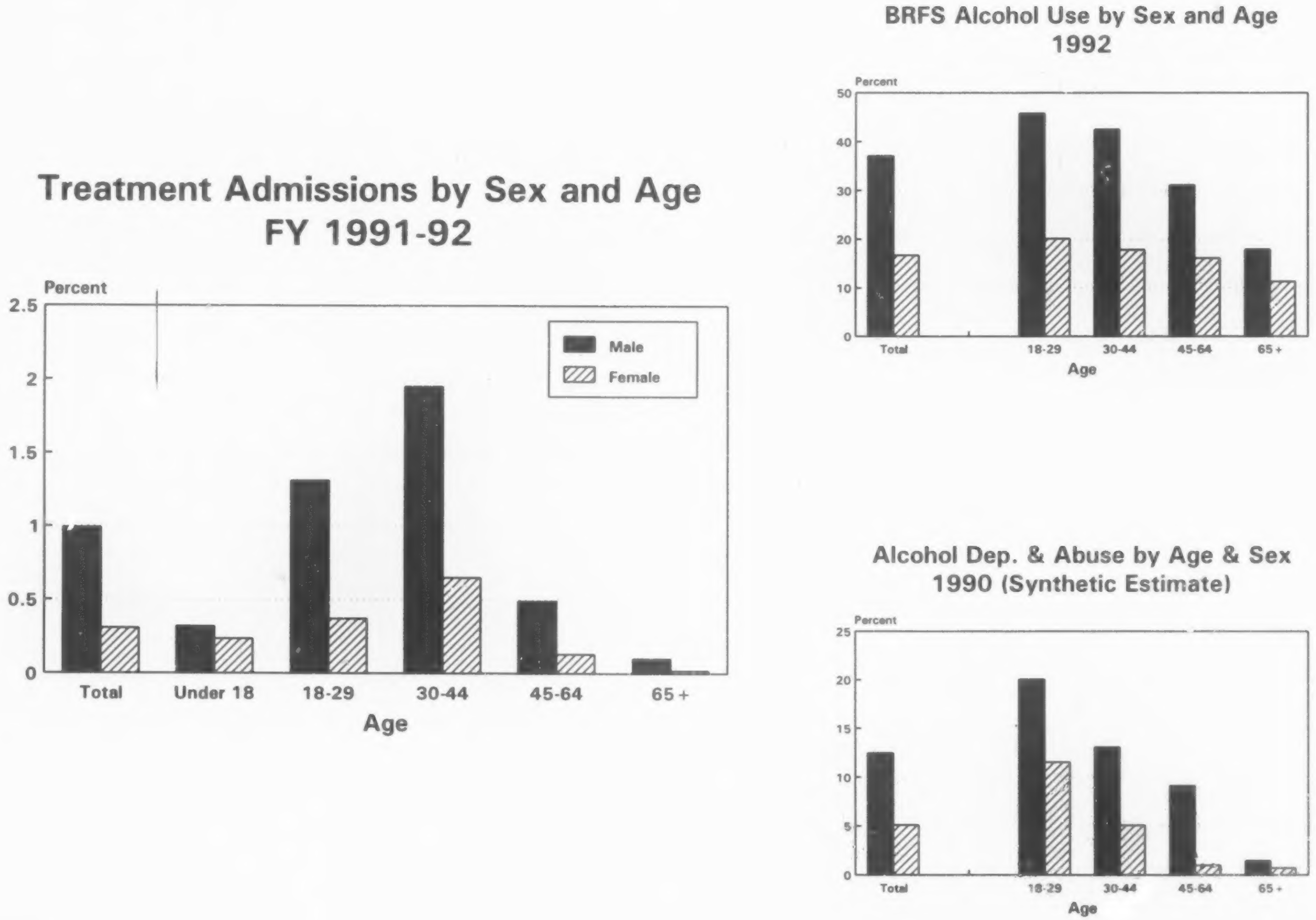


FIGURE VIII.2: Comparisons of Three Data Sources by Gender and Age
(Rates calculated as percent of total Michigan population base.)


Treatment Admissions by Sex and Age
FY 1991-92

BRFS Alcohol Use by Sex and Age
1992

Alcohol Dep. & Abuse by Age & Sex
1990 (Synthetic Estimate)

treatment utilization patterns. An important segment of alcohol users is not covered by BRFS since only those 18 years or older are interviewed. Treatment admissions data clearly show that persons under 18 years of age have a distinctly different pattern of alcohol use, including a diminishing gender gap. Studies of adolescents have shown that alcohol is the most common drug used by young people and that there are significant problems experienced by this group as a result of their alcohol use.[20] To produce a comprehensive and balanced picture of alcohol problems, use of more than one research method or data source continues to be needed.

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IX. SAFETY BELT NONUSE

Heather Festerling, M.A.; Barbara A. Schillo, M.A.; Ann P. Rafferty, Ph.D.

BACKGROUND

Motor vehicle crashes continue to rank as a leading cause of morbidity and mortality for persons in Michigan, as well as the United States. According to the National Highway Traffic Safety Administration, in 1992, 39,235 people lost their lives in motor vehicle crashes, a decrease of 6 percent from 1991 and the lowest number since 1962 (38,980).[1] However, this figure represents an average of approximately 107 deaths per day, or one every 13 minutes. If these fatalities occurred in one place at the same time, such as with an airplane or school bus crash, most people would perceive this as a major disaster; and if crashes of this magnitude occurred every day, there would be a public outcry demanding that ways to reduce this problem be defined and enforced.

Not only are the numbers of injuries and deaths due to motor vehicle crashes very large, they are also very costly, both in terms of quality of life and economic costs. The calculable costs of motor vehicle crashes include wage and productivity losses, medical expenses, administrative expenses, motor vehicle damage, and employer costs. The National Safety Council estimates that in 1992, the cost for all these items for each death (not fatal accident) was $880,000. Based on this figure, in Michigan in 1992, motor vehicle-related fatalities resulted in $1.1 billion in costs.[2]

In 1992, there were 1,296 people killed and 108,585 injured on Michigan roads[3], thus four people died and 297 were injured each day due to motor vehicle crashes. It is just this kind of risk of motor vehicle-related injury and death that prompted legislators to enact safety belt and child restraint laws to help protect passengers. The National Highway Traffic Safety Administration has estimated that safety belts reduce fatalities by 40-50 percent and serious injuries by 45-55 percent.[4] From 1983 to 1992, it is estimated that safety belts saved 34,794 lives (5,226 in 1992) in the U.S.[5] In view of the effectiveness of safety belts, restraint laws have been enacted in Michigan which require all front seat passengers and children under the age of 16 to buckle up.

Ongoing direct observation of safety belt use has been conducted since before the inception of Michigan's first safety belt law in 1985. According to studies conducted by the University of Michigan Transportation Research Institute (UMTRI), safety belt use has increased from 18.3 percent in December 1984 to 57 percent in June 1992.[6] During the summer of 1993, a statewide safety belt educational campaign coupled with increased enforcement efforts was undertaken by state agencies and departments, law enforcement agencies, businesses, and corporations. The campaign was highlighted with extensive publicity. Based on observational studies conducted by UMTRI after this push to increase safety belt usage, front outboard safety belt use in

Michigan rose from 57 percent in June of 1992 to 64.4 percent in September 1993.[7] (Usage rates may vary from one set of observation studies to another since different methodologies were used to survey occupant safety belt use.)

Despite these increases, certain subpopulations (young adults, males, African-Americans, and people with low education and income levels) still have low usage rates for this important safety device, and are, therefore, at high risk for crash-related injuries and fatalities. This is demonstrated in traffic crash fatality statistics. For example, in the United States for the past five years, males have had a higher fatality rate per capita than females in all age groups.[8] In 1992, the fatality rates for the adult male age groups of 21-24 and 24-35 were 3 times higher than females of the same age groups. In addition, on a per population basis, drivers under the age of 25 had the highest rate of involvement in fatal crashes among all age groups.[9] For these subpopulations, especially young adult males, much work still needs to be done in order to reach the Year 2000 Objective for the Nation of increasing the use of safety belts to at least 85 percent of motor vehicle occupants.[10]

CURRENT FINDINGS

Self-reported frequencies for safety belt use for Michigan adults by age, gender, race, education, and household income are displayed in Table IX.1. Sixty-six percent of the respondents indicated that they always wear a safety belt when driving or riding in a car, while 18.6 percent reported "nearly always". Approximately 12 percent of the respondents indicated that they wore safety belts infrequently and only 3.7 percent reported never using a safety belt. Non-users of safety belts were significantly more likely to be young (18-24), male, African-American, had not graduated from college, or had lower incomes (<$20,000). Whites reported using safety belts "always" significantly more often compared to African-Americans. College graduates were significantly more likely to report "always" using safety belts compared to respondents in every other educational category.

TRENDS AND COMPARISONS

Upon review of previous years' BRFS reports, the proportion of respondents who reported using safety belts "sometimes," "seldom," or "never" decreased 58.5 percentage points between the 1982 (73.7%) and the 1992 (15.2%) surveys (Figure IX.1).

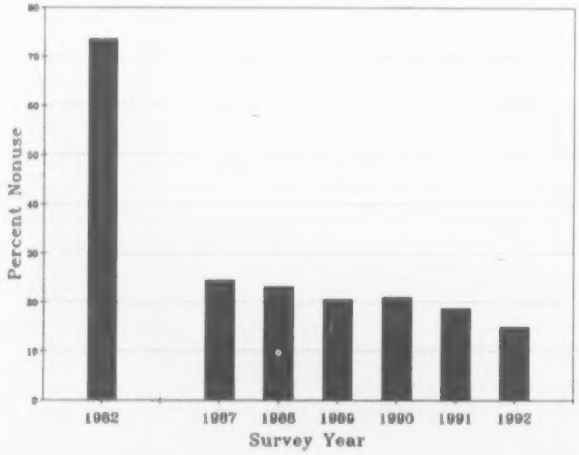
FIGURE IX.1
Safety Belt Nonuse: Proportion Reporting Sometimes, Seldom, or Never
Michigan BRFS, 1982 and 1987-1992

TABLE IX.1

Frequency of Safety Belt Use, by Demographic Characteristics
Michigan Adults, 1992
(in percentage, with 95% confidence interval limits)

	Frequency of Safety Belt Use[1]				
Demographic Characteristics	Always	Nearly Always	Sometimes	Seldom	Never
Total	66.1 (±2.2)	18.6 (±1.8)	7.9 (±1.3)	3.6 (±0.8)	3.7 (±0.9)
Age					
18-24	48.2 (±6.6)	25.0 (±6.1)	15.5 (±4.8)	5.2 (±3.1)	6.1 (±3.3)
25-34	64.5 (±4.4)	16.7 (±3.4)	8.5 (±2.6)	5.9 (±2.1)	3.8 (±1.8)
35-44	73.9 (±4.2)	14.7 (±3.3)	5.7 (±2.4)	2.6 (±1.4)	3.2 (±1.6)
45-54	70.1 (±5.3)	15.9 (±4.4)	8.3 (±3.2)	3.1 (±2.0)	2.6 (±1.8)
55-64	67.9 (±6.1)	21.5 (±5.4)	4.9 (±3.1)	2.8 (±1.9)	3.0 (±1.8)
65-74	69.7 (±5.6)	21.3 (±5.1)	4.5 (±2.7)	1.1 (±1.2)	3.2 (±2.1)
75 and Older	71.6 (±7.8)	18.5 (±6.8)	4.5 (±3.2)	0.4 (±0.9)	3.0 (±2.7)
Gender					
Male	59.1 (±3.4)	20.3 (±2.8)	10.3 (±2.1)	4.7 (±1.4)	5.5 (±1.5)
Female	72.4 (±2.6)	17.1 (±2.2)	5.7 (±1.4)	2.5 (±1.0)	2.0 (±0.7)
Race					
White	67.8 (±2.2)	18.4 (±1.9)	6.9 (±1.3)	3.5 (±0.9)	3.3 (±0.9)
African-American	55.0 (±6.7)	20.9 (±5.1)	13.5 (±4.7)	3.9 (±2.2)	5.9 (±3.5)
Education					
Less than H.S.	57.1 (±5.8)	17.2 (±4.4)	12.1 (±4.1)	4.1 (±2.4)	8.8 (±3.5)
H.S. Graduate	63.6 (±3.5)	19.1 (±2.9)	9.7 (±2.3)	4.1 (±1.4)	3.5 (±1.3)
Some College	64.5 (±4.2)	20.6 (±3.7)	7.4 (±3.4)	4.3 (±1.9)	2.9 (±1.4)
College Grad	78.1 (±3.8)	16.3 (±3.5)	2.5 (±1.4)	1.5 (±1.0)	1.5 (±1.0)
Income					
< $10,000	58.3 (±6.0)	19.7 (±4.8)	10.9 (±4.1)	3.0 (±2.4)	6.2 (±2.9)
$10,000-19,999	58.2 (±5.3)	22.4 (±4.4)	10.0 (±3.3)	4.2 (±2.0)	5.3 (±2.5)
$20,000-34,999	65.7 (±4.4)	18.7 (±3.4)	8.6 (±2.6)	4.2 (±1.8)	2.8 (±1.4)
$35,000-50,000	69.3 (±4.9)	17.5 (±4.1)	5.9 (±2.2)	3.4 (±2.0)	4.0 (±2.1)
> $50,000	72.0 (±4.6)	17.8 (±4.0)	5.2 (±2.4)	3.5 (±1.8)	1.5 (±1.0)

[1] Reflects responses to the question: "How often do you use seat belts when you drive or ride in a car? Rows may not total 100 percent due to respondents who reported that they never drive or ride in a car.

The greatest decrease in this proportion was noted between the 1982 and 1987 surveys, thus suggesting the impact of Michigan's safety belt legislation. Since 1987, the percentage of respondents who reported wearing safety belts infrequently or never has decreased at a much slower rate. After a comparison of BRFS data between the 1982 and 1987 surveys, Mayer et al. reported that although Michigan's mandatory safety belt law improved the frequency of belt use, the traditionally high risk groups (the younger age groups, African-Americans, and those with low education) still reported using belts less frequently.[11] This pattern remained consistent in 1992, as demonstrated in Table IX.1. Comparisons with national or other states' use rates are difficult to interpret due to the wide variety of safety belt laws, types of enforcement, and methods of evaluation.

COMMENT

It is important to take into account the social desirability bias inherent in self-reported data; that is, people are more likely to report a behavior that they feel is "favored" by society. In this instance, some respondents may be hesitant to respond that they are breaking the law, even in an anonymous situation. Thus, statistics derived from self-reported data can over-estimate the true frequency of a behavior. In Michigan there was approximately a nine percentage point difference between safety belt use figures derived from self-reported BRFS data (66.1%) compared to observational data in 1992 (57%).

Many traffic safety agencies rely mainly on observational data to measure progress toward achieving national safety belt use objectives. As of 1992, most states had not reached the 70 percent belt use target set by the National Highway Traffic Safety Administration, and Michigan was no exception. As a result, efforts will be intensified to achieve the Year 2000 Objectives for the Nation of increasing the use of safety belts to at least 85 percent of motor vehicle occupants.[12]

Although safety belt use has increased since the passage of Michigan's safety belt legislation, certain high risk groups (young adults, males, African-Americans, and people with low education and income levels) stand as exceptions. This group of nonusers presents the biggest challenge to health and safety professionals. The reasons for safety belt nonuse need to be more narrowly defined and specific educational, engineering, and legislative efforts should be directed toward dispelling safety belt myths and other obstacles to buckling up.

The passage of the latest modification to Michigan's safety belt law, which requires children aged 4-15 years be restrained whenever they are riding in a motor vehicle, has lead to the implementation of new promotion initiatives to increase awareness of the risks of safety belt nonuse, e.g., the summer 1993 safety belt educational campaign. In addition, efforts have been initiated to make Michigan's safety belt law a primary enforcement law. Currently, Michigan's safety belt law is the only traffic safety law in the State that is a secondary enforcement law, which means that a motorist cannot be cited for not wearing a safety belt unless stopped for another violation. Based on the experience of states that do have primary enforcement laws, UMTRI estimates suggest that an increase in safety belt usage from between 13 and 17 percentage points would be possible in Michigan.[13] A primary enforcement law, therefore, has the potential of bringing Michigan very close to reaching the national objective of 85 percent safety belt use.

Young adults tend to feel that they are not vulnerable to injuries and this makes them an especially high risk group for safety belt nonuse. It has been found that young people's beliefs reflect common safety belt myths, such as that it is not as important to wear safety belts on short trips as they are less risky than long ones, and that it is unnecessary to wear a safety belt in the back seat.[14] Programs designed to educate children and adolescents regarding the rationale for proper safety belt use and the misperceptions about young people's risk of injury would be beneficial in eventually reducing the morbidity and mortality due to motor vehicle crashes of today's young people as they move into adulthood.

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X. WOMEN'S CANCER SCREENING

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BACKGROUND

Breast cancer is the most frequently occurring type of cancer among women and the second leading cause of cancer related death.[1] It is estimated that in 1993, 182,000 women in the U.S. were diagnosed with breast cancer and 46,000 died of this disease.[2] In Michigan, the breast was the leading site of cancer in women in 1991, accounting for approximately one-third of all cancers in women.[3]

Mammography is capable of imaging very small, non-palpable breast cancers 80 percent of the time. Mortality from breast cancer can be reduced by as much as 30 percent through population based screening programs that encourage regular mammography and physical breast examination by a health care provider in accordance with the American Cancer Society (ACS) recommendations.[2,4,5,6,7] The current (1992) ACS recommendations state that clinical examination of the breast and mammography are complementary and both are necessary to achieve maximum breast cancer detection rates for women age 40 and older. Before age 40, screening mammography is not recommended, although a clinical breast exam should be performed every 1-3 years for all women 20-39 years old. Women 40-49 years old should have an annual clinical breast examination and a screening mammogram performed at one- to two-year intervals. Beginning at age 50, women should have both a clinical breast examination and mammography annually.[8,a]

Although there is controversy regarding whether there is mortality reduction among women 40-49 who adhere to the recommended mammography screening guidelines,[9,10,11,12,13] there is consensus that studies done to date have insufficiently included women from that age group, making firm conclusions impossible. However, there is little controversy about the benefit of annual mammograms in combination with physical breast exams for women aged 50 years and older.[14,15,16,17,18,19]

The Pap test is a method of screening for cancer of the uterine cervix. Current recommendations leave the frequency of Pap testing up to the physician, although a screening interval of one to three years is usually suggested.[20]

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[a] In 1991, the ACS was still recommending, in addition to the above schedule, that asymptomatic women obtain one baseline screening mammogram between the ages of 35 and 39. This, however, is no longer recommended.

The 1992 Michigan BRFS included a series of questions on women's health issues, including questions on mammography screening and Pap testing, the results of which are included in this report.

CURRENT FINDINGS

Clinical Breast Exams and Mammography Screening

Nearly 90 percent (88.8%) of female respondents 20 years and older reported having had at least one clinical breast exam (Table X.1). However, only 72.8 percent reported having their last clinical breast exam within the time frame recommended by the ACS.[b] The proportion of women who reported having had a clinical breast exam within the appropriate time frame ranged from 85 percent among those 20-39 years of age to less than half (47.4%) of those women 70 years and older. Appropriate breast exam screening was also related to both education and household income, with more highly educated women and those living in households with higher incomes being more likely to have had a clinical breast exam within the recommended time period.

Overall, 56.4 percent of the female respondents 18 years and older[c] reported ever having had a mammogram, 65.3 percent of which had been done within the previous 12 months. The majority of the mammograms (85.6%) were done as part of a routine checkup, 12.0 percent were done for various breast problems, and 2.4 percent were done because the woman had a previous history of breast cancer.

Seventy-three percent (72.8%) of the 18-39 year old female respondents reported that they had never had a mammogram and 7.0 percent reported that they had had a mammogram because of breast cancer or other breast problem (Table X.2). Routine mammograms for women less than 40 years of age are not currently part of the ACS recommendations, however, 20.1 percent of the 1992 BRFS female respondents 18-39 years old reported that they had had a routine mammogram.[d]

Eighty-two percent of women 40 years and older reported that they had had at least one mammogram. However, only 59.9 percent of these respondents had had their last mammogram in accordance with the ACS recommendations for screening mammography, i.e., a routine mammogram within two years for women 40-49 years old and within one year for women 50 years and older (Table X.3). Respondents who had had mammograms because of breast cancer or other breast problems were not included in the calculations of proportions of women who

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[b] The ACS recommends a clinical breast exam every 1-3 years for women 20-39 years old and every year for women 40 years and older. In this analysis a women was categorized as having had "appropriate breast exam screening" if her last physical breast exam was within the previous three years for women 20-39 years and within the previous year for women 40 years and older.

[c] The sample size for female respondents 18 years and older was 1375.

[d] Prior to 1992, the ACS was recommending that asymptomatic women obtain one baseline screening mammogram between the ages of 35 and 39. It may be that some of these women received a screening mammogram according to this previous recommendation.

TABLE X.1
Clinical Breast Exam, By Demographic Characteristics
Michigan Women 20 Years and Older
BRFS 1992
(in percent with 95% confidence interval limits)

Demographic Characteristics	Ever Had Breast Exam[1]		Had Appropriate Breast Exam Screening[2]	
Total	88.8	(±1.9)	72.8	(±2.8)
Age				
20-29	89.2	(±5.3)	85.7	(±5.8)
30-39	92.8	(±3.2)	85.8	(±4.4)
40-49	94.1	(±3.3)	71.6	(±6.6)
50-59	93.0	(±3.7)	70.2	(±7.7)
60-69	83.3	(±5.9)	54.9	(±7.9)
70 and Over	75.1	(±6.2)	47.4	(±7.7)
Race				
White	89.6	(±2.1)	73.0	(±2.9)
African-American	83.4	(±5.8)	71.3	(±8.5)
Education				
Less than H.S.	74.3	(±7.1)	47.5	(±8.7)
H.S. Graduate	86.7	(±3.2)	70.5	(±4.4)
Some College	92.5	(±3.9)	80.1	(±5.2)
College Graduate	96.6	(±2.4)	82.3	(±5.0)
Income				
<$10,000	78.0	(±6.1)	61.1	(±7.5)
$10,000 - $19,999	82.5	(±5.3)	61.4	(±6.8)
$20,000 - $34,999	94.3	(±2.8)	80.1	(±5.1)
$35,000 - $50,000	93.7	(±4.1)	78.5	(±6.4)
>$50,000	97.3	(±2.8)	83.3	(±5.7)

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[1] Proportion of female respondents 20 years and older who reported that they had ever had a clinical breast exam.

[2] Proportion of female respondents 20 years and older whose last breast exam was within the time frame recommended by the ACS, i.e., within the previous three years for women 20-39 years old and within the previous year for women 40 years and older. Respondents whose last clinical breast exam was done because of breast cancer or other breast problem were not included in this analysis.

TABLE X.2

Mammography Screening, by Demographic Characteristics,
Michigan Female Adults 18-39 Years Old
BRFS 1992
(in percent with 95% confidence interval limits)

Demographic Characteristics	Never Had Mammogram[1]	Had Mammogram For Problem[2]	Had Routine Mammogram[3]
Total	72.8 (±3.9	7.0 (±2.3)	20.1 (±3.4)
Age			
18-24	84.0 (±4.7)	4.1 (±2.2)	11.9 (±4.3)
25-34	60.3 (±6.1)	10.3 (±4.1)	29.4 (±5.4)
Race			
White	74.9 (±4.3)	7.2 (±2.6)	17.9 (±3.6)
African-American	58.0 (±10.6)	7.4 (±5.3)	34.6 (±10.8)
Education			
Less than H.S.	76.3 (±16.3)	1.3 (±2.6)	22.4 (±16.2)
H.S. Graduate	74.2 (±6.1)	6.6 (±3.8)	19.2 (±5.3)
Some College	78.2 (±6.7)	7.3 (±4.0)	14.6 (±5.7)
College Graduate	60.0 (±9.1)	9.6 (±5.6)	30.4 (±8.4)
Income			
<$10,000	82.0 (±9.4)	5.3 (±7.3)	12.7 (±6.9)
$10,000 - $19,999	76.9 (±8.9)	4.0 (±4.1)	19.1 (±8.3)
$20,000 - $34,999	77.2 (±6.7)	8.4 (±4.2)	14.4 (±5.5)
$35,000 - $50,000	69.6 (±9.1)	5.6 (±4.4)	24.8 (±8.6)
>$50,000	55.5 (±10.7)	11.0 (±6.5)	33.5 (±10.2)

[1] Proportion of female respondents 18-39 years old who reported never having had a mammogram.

[2] Proportion of female respondents 18-39 years old who reported ever having had a mammogram and that their last mammogram was performed because of breast cancer or other breast problem.

[3] Proportion of female respondents 18-39 years old who reported ever having had a mammogram and that their last mammogram was part of a routine checkup.

TABLE X.3

Mammography and Appropriate Breast Screening, by Demographic Characteristics,
Michigan Female Adults 40 Years and Older
BRFS 1992
(in percent with 95% confidence interval limits)

Demographic Characteristics	Ever Had Mammogram[1]	Had Appropriate Mammography Screening[2]	Had Appropriate Breast Screening[3]
Total	82.4 (±2.8)	59.9 (±4.0)	50.2 (±4.1)
Age			
40-49	82.5 (±5.2)	70.8 (±6.7)	59.2 (±7.7)
50-59	87.9 (±5.4)	64.8 (±8.0)	57.9 (±8.5)
60-69	83.9 (±5.8)	57.0 (±8.5)	45.9 (±8.3)
70 and Over	75.0 (±6.4)	44.7 (±7.9)	35.7 (±7.6)
Race			
White	82.5 (±3.0)	60.3 (±4.2)	50.7 (±4.2)
Black	82.2 (±8.9)	58.6 (±12.4)	48.1 (±13.4)
Education			
Less than H.S.	74.7 (±7.7)	46.7 (±9.3)	33.3 (±9.1)
H.S. Graduate	78.9 (±5.0)	59.0 (±6.2)	48.6 (±6.4)
Some College	86.5 (±5.6)	63.5 (±8.3)	59.5 (±8.5)
College Graduate	92.5 (±4.0)	71.7 (±8.2)	59.5 (±9.0)
Income			
<$10,000	69.9 (±8.4)	38.7 (±9.3)	29.8 (±9.4)
$10,000 - $19,999	74.0 (±7.6)	50.2 (±8.9)	37.6 (±8.7)
$20,000 - $35,000	90.0 (±5.0)	63.2 (±8.6)	55.3 (±8.9)
$35,000 - $50,000	85.2 (±6.7)	71.3 (±9.3)	56.9 (±10.7)
>$50,000	91.0 (±5.6)	76.6 (±8.6)	70.3 (±9.2)

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[1] Proportion of female respondents 40 years old and older who reported ever having had a mammogram.

[2] Proportion of female respondents 40 years old and older who reported having had a routine mammogram within the appropriate time period, i.e., within two years for women 40-49 years old and within one year for women 50 years and older. Respondents whose last mammogram was done because of breast cancer or other breast problem were not included in this analysis.

[3] Proportion of female respondents 40 years and older who had both clinical breast exam and mammography screening within the recommended time frame.

engaged in appropriate mammography screening. There were significant differences, by a chi-square test of independence, in the proportion of women who had had appropriate mammography screening by age groups and categories of education and household income. Women 70 years and older were less likely to have had appropriate mammography screening (44.7%) than women in any other age group. A lower proportion of women who had not completed high school had had appropriate mammography screening (46.7%) than women who had graduated from college (71.7%). There was also an inverse relationship between appropriate mammography screening and household income with the proportion of women who had received appropriate mammography screening ranging from 38.7 percent among those women who lived in households with incomes of less than $10,000 to 76.6 percent among those who lived in households with incomes $50,000 or greater.

Only half (50.2%) of women 40 years and older reported having had both a screening mammogram as well as a clinical breast exam within the respective recommended time periods. Similar to the results for appropriate mammography screening, older women, women with less formal education, and women living in households with lower incomes were less likely to have had appropriate breast screening using a combination of clinical breast exam and mammography.

Pap Tests

Ninety-four percent of all women reported that they had had a Pap test (Table X.4). Women at either end of the age range, i.e., women 18-29 and 70+ years, were less likely to have had a Pap test than those women in the middle age groups. There appeared to be inverse relationships between the proportion of women who have ever had a Pap test and both education and income.

Among those women who had had a routine Pap test, 69.7 percent had had the test within the previous year, 13.5 percent between one and two years prior, 5.5 percent between two and three years prior, and 11.2 percent had had their last Pap test more than three years prior. Nearly 17 percent of all female respondents had not had a routine Pap test within the previous three years, and therefore would be considered at risk. Older women (Figure X.1), women who had lower levels of education, and women who lived in households with lower incomes were less likely to have had a Pap test within the previous three years.

FIGURE X.1
Proportion Who Had Not Had Pap Test
Within Three Years by Age
Michigan Females, 1992

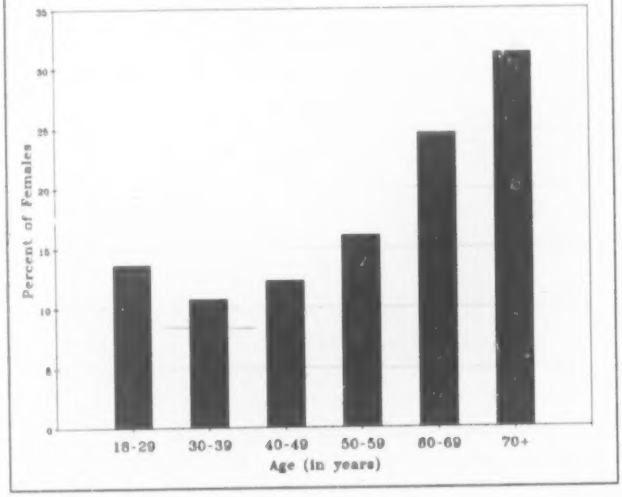

TABLE X.4

Frequency of Pap Smear Tests,
Michigan Women, 1992
(in percent with 95% confidence interval limits)

Demographic Characteristics	Ever Had Pap Test[1]	Months Since Last Routine Pap Test[2]			
		0-12	13-24	25-36	37+
Total	94.2 (±1.6)	69.7 (±2.8)	13.5 (±2.0)	5.5 (±1.4)	11.2 (±1.9)
Age					
18-29	89.4 (±5.0)	86.2 (±4.9)	7.8 (±3.7)	4.5 (±3.3)	1.5 (±1.4)
30-39	97.0 (±2.5)	74.3 (±5.5)	16.2 (±4.5)	1.7 (±1.5)	7.8 (±3.4)
40-49	98.8 (±2.0)	72.9 (±6.4)	9.1 (±3.9)	7.0 (±3.7)	11.1 (±4.3)
50-59	97.8 (±1.8)	65.4 (±8.2)	15.6 (±6.2)	4.9 (±3.4)	14.1 (±6.4)
60-69	95.5 (±3.6)	55.0 (±8.2)	16.1 (±6.3)	8.2 (±4.8)	20.7 (±6.7)
70+	88.3 (±5.0)	47.5 (±8.2)	20.3 (±6.8)	10.8 (±5.2)	21.5 (±6.7)
Race					
White	94.0 (±1.8)	69.0 (±3.0)	13.8 (±2.1)	5.5 (±1.6)	11.8 (±2.1)
African-American	96.7 (±2.8)	73.6 (±7.9)	12.5 (±6.2)	5.7 (±3.5)	8.2 (±5.1)
Education					
Less than H.S.	88.1 (±5.8)	62.6 (±8.5)	13.7 (±6.0)	8.3 (±4.8)	15.4 (±6.3)
H.S. Graduate	95.7 (±2.0)	68.3 (±4.5)	13.6 (±3.3)	5.1 (±2.0)	13.0 (±3.4)
Some College	93.1 (±4.0)	73.7 (±5.0)	12.3 (±3.7)	4.7 (±2.8)	9.4 (±3.2)
College Grad	96.9 (±2.4)	71.6 (±5.7)	14.3 (±4.6)	6.1 (±3.4)	8.0 (±3.4)
Income					
< $10,000	91.2 (±4.0)	60.1 (±7.5)	19.5 (±6.7)	8.8 (±4.5)	11.7 (±4.5)
$10,000-19,999	89.4 (±4.9)	60.3 (±6.7)	13.6 (±4.5)	8.1 (±4.0)	18.0 (±5.4)
$20,000-34,999	95.7 (±2.8)	71.3 (±5.6)	11.8 (±4.0)	6.4 (±3.0)	10.6 (±3.7)
$35,000-50,000	96.2 (±3.5)	73.5 (±6.5)	15.7 (±5.4)	2.3 (±2.1)	8.5 (±3.9)
>$50,000	98.3 (±2.4)	77.3 (±6.1)	11.8 (±4.5)	3.6 (±3.3)	7.3 (±3.9)

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[1] Proportion of female respondents who reported that they had ever had a Pap test.

[2] Proportion of those female respondents who reported to have ever had a Pap test. Respondents whose last Pap test was done because of a problem were removed from this analysis.

TRENDS AND COMPARISONS

Questions about mammography use have been included in the main core of the BRFS since 1989. It appears that there may have been an increase between 1991 and 1992 in the proportion of women 40 years and older who reported to have ever had mammogram (Table X.5). However, it does not appear that there has been an increase in the proportion of women in this age group who have had a mammogram within the time frame recommended by the ACS.

TABLE X.5
Mammography Screening Prevalence Rates
Michigan Female Adults 40 Years and Older
Michigan BRFSS 1989 - 1992
(in percent with 95% confidence interval limits)

Demographic Characteristics	Ever Had Mammogram[1]	Had Appropriate Mammography Screening[2]
1989	74.3 (±3.5)	57.9 (±4.3)
1990	74.2 (±3.4)	55.8 (±4.2)
1991	75.6 (±3.4)	55.9 (±4.0)
1992	82.4 (±2.8)	59.9 (±4.0)

[1] Proportion of female respondents 40 years old and older who reported ever having had a mammogram.
[2] Proportion of female respondents 40 years old and older who reported having had a routine mammogram within the appropriate time period, i.e., within two years for women 40-49 years old and within one year for women 50 years and older. Respondents whose last mammogram was done because of breast cancer or other breast problem were not included in this analysis.

The Michigan prevalence rates for three of the women's cancer screening indicators are above the median values in the distributions for the 48 states and the District of Columbia that participated in the 1992 BRFSS. The median proportion of all women (18 years and older) who had ever had a mammogram was 50.2 percent (range 41.6% - 56.4%), compared with 56.4 percent in Michigan. In Michigan, 82.4 percent of women 40 years and older had ever had a mammogram, compared with a median value of 74.0 percent (range 57.4% - 82.3%).[e] Ninety-four percent (94.1%) of all women in Michigan reported to have had a Pap test; this was slightly above the median for participating states of 93.1 percent (range 87.4% - 97.5%).

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[e] Due to slight variations in calculations, the proportion of women 40 years and older who had ever had a mammogram reported by CDC for Michigan was marginally higher (82.29%) than the proportion reported by MDPH in this report. This proportion for Michigan was the highest reported by CDC for all participating states.

COMMENT

The current guidelines for screening mammography state that all women 40-49 years old should have a mammogram every one to two years, and those aged 50 and above should have a mammogram annually. Our results indicate that, in 1992, 40 percent of women 40 years and older were not following the above screening recommendations and this situation has not improved since 1989. Our results also indicate that approximately 20 percent of Michigan women who are younger than age 40 appear to be receiving screening mammography, contrary to national recommendations, raising concerns about rising health care costs without consensus as to benefit.

The recommended frequency for Pap testing is not as specific as for mammography. However, approximately 17 percent of all female respondents reported that they had not had a Pap test in the last three years. Even though the rates in Michigan are higher for both mammography screening and Pap testing than in many other states, further efforts are required to improve the compliance for all appropriate age groups, if mortality is to be reduced.

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XI. AIDS AWARENESS

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BACKGROUND

Between 1981, when AIDS was first identified, and November 30, 1993, Michigan reported 5,158 cases of AIDS to the Centers for Disease Control and Prevention (CDC). Of these, 2,847 (55%) have died of the disease.[1] It is estimated that between 10,000 and 15,000 people in Michigan are currently infected with human immunodeficiency virus (HIV).[2]

Men who have sex with other men and injecting drug users represent the greatest proportions of reported cases of AIDS both nationally and in Michigan. Men reporting same gender sexual contact accounted for 58 percent (844 of 1,466) of all Michigan AIDS cases reported to the CDC through 1989. Of all AIDS cases reported from Michigan for the first nine months of 1993, 50 percent (797 of 1,602) were associated with male-to-male sexual contact. Twenty-three percent (331 of 1,466) of all Michigan AIDS cases reported to the CDC through 1989 and 29 percent (460 of 1,602) of all AIDS cases reported during the first nine months of 1993 were associated with injecting drug use.[3]

A greater diversity is now recognized to exist among populations at-risk for or infected with HIV than when AIDS was first identified. The proportion of HIV cases attributed to male-to-male sex is decreasing while the proportion of HIV cases associated with injecting drug use and heterosexual transmission is increasing. Active surveillance of HIV infection was implemented in Michigan in April of 1992. Of 674 people with HIV reported confidentially who are still living and for whom risk exposure is known, 37 percent (247 of 674) are men who reported same gender sexual contact as their primary risk exposure. Thirty-five percent (238 of 674) reported injecting drug use and 18 percent (119 of 674) reported heterosexual contact as their primary risk exposure to HIV.[2]

The increase in the number of cases attributed to heterosexually acquired infection is reflected in the growing number of women affected by the epidemic. In Michigan, women account for 12 percent (644 of 5,158) of AIDS cases reported to the CDC through September of 1993 and for 29 percent (271 of 950) of all reported cases of HIV infection (April, 1992 through June 30, 1993) in Michigan.[1,2] In 1985, men were 20 times more likely than women to be reported with AIDS. By 1992, men were only 7 times more likely than women to be reported with AIDS.[4] It is estimated that there are currently between 1,300 and 4,350 women infected with HIV living in Michigan.[2] These data strongly suggest that, in Michigan, women will bear an increasing burden of this epidemic.

Racial and ethnic minorities, particularly African-Americans, are disproportionately affected by this epidemic. Non-minorities account for 83 percent of Michigan's population and for 45 percent (2,329 of 5,158) of its cumulative AIDS cases. Thirty-one percent (293 of 950) of all living cases of HIV reported confidentially were non-minorities. African-Americans, who account for 14 percent of the state's population, account for 52 percent (2,690 of 5,158) of its cumulative AIDS cases and 65 percent (608 of 950) of all living cases of HIV infection reported (April, 1992 to June 30, 1993) in Michigan.[1,2,5] It is estimated that there are currently between 5,300 and 9,600 African-Americans infected with HIV in Michigan.[2]

Although Detroit and southeastern Michigan will continue to bear the largest burden of this epidemic, soon no area of Michigan will be untouched by HIV disease. The city of Detroit accounts for 46 percent (2,347 of 5,158) of all Michigan AIDS cases.[1] The AIDS case rate in this city is currently 228 per 100,000.[1] At least one case of HIV or AIDS has been reported in 76 of Michigan's 83 counties. Surveillance indicators suggest that there are individuals infected with HIV in every county in Michigan although reports have not been received on every individual infected with HIV.[1,2]

CURRENT FINDINGS

The results presented in this chapter differ from results presented in previous chapters in that they do not necessarily represent health risks, but rather beliefs and attitudes towards a particular health risk. The analyses presented in this chapter also differ slightly from those presented in other chapters, in that "don't know" was considered a valid response for all of the AIDS knowledge and belief questions.

In response to items assessing general AIDS-related knowledge, nearly all (98.2%) of the respondents reported that they had heard the AIDS virus called by the name HIV. Over half (58.7%) of the respondents reported awareness of the availability of drugs that could lengthen the life of a person infected with the AIDS virus, while 7.4 percent reported that they did not know. The majority of respondents (84.5%) thought that a person infected with the AIDS virus could look and feel well and healthy, while 4.5 percent reported that they did not know.

Results from four of the questions concerned with people's knowledge and beliefs about the transmission and prevention of the HIV virus are presented in Table XI.1. More than nine out of 10 respondents (94.5%) reported correctly that they thought a pregnant woman who has the AIDS virus can give it to her baby; only 2.8 percent reported they did not know. Three-quarters (76.6%) of respondents thought that a person could become infected from being cared for by a health care worker who has the AIDS virus; 2.7% reported they did not know.

A significant proportion of respondents (42.9%) reported incorrectly that they thought a person could become infected with the AIDS virus from donating blood; 1.4 percent reported they did not know. The data suggested significant relationships between age of the respondent, educational achievement, and household income, and the correct denial of infection resulting from blood donation. Younger respondents and those with higher educational levels and household incomes were more likely to deny correctly the donation of blood as a route of transmission. Additionally, whites (41.3%) were more likely than African-Americans (53.4%) to deny correctly

TABLE XI.1

Knowledge and Beliefs Regarding HIV Transmission and Prevention
BRFS 1992
(in percentages, with 95% confidence interval limits)

Demographic Characteristics	Give AIDS To Baby[1]	Infected Health Care Worker[2]	Donating Blood[3]	Condom Effectiveness[4]
Total	94.5 (±1.0)	76.6 (±2.0)	42.9 (±2.3)	31.1 (±2.2)
Age				
18-24	94.5 (±3.1)	65.9 (±6.2)	41.3 (±6.8)	40.8 (±6.7)
25-34	96.8 (±1.6)	78.6 (±3.7)	36.6 (±4.4)	35.9 (±4.5)
35-44	95.3 (±2.0)	76.4 (±4.0)	36.1 (±4.5)	30.5 (±4.3)
45-54	95.3 (±2.5)	78.9 (±4.9)	43.4 (±5.9)	31.3 (±5.5)
55-64	95.3 (±2.7)	84.1 (±4.6)	44.7 (±6.3)	25.1 (±5.4)
65-74	91.6 (±3.4)	80.0 (±4.8)	56.5 (±6.1)	20.8 (±5.0)
75 and Over	83.7 (±6.2)	67.8 (±8.2)	67.6 (±7.9)	18.4 (±6.9)
Sex				
Male	94.0 (±1.6)	78.3 (±2.9)	45.2 (±3.4)	33.7 (±3.2)
Female	94.9 (±1.3)	75.1 (±2.6)	40.8 (±2.9)	28.7 (±2.7)
Race				
White	94.4 (±1.1)	76.6 (±2.1)	41.3 (±2.4)	30.5 (±2.3)
African-American	95.0 (±2.9)	77.1 (±5.7)	53.4 (±6.9)	34.7 (±6.7)
Education				
Less than H.S.	91.0 (±3.4)	74.3 (±5.2)	67.3 (±5.8)	21.5 (±5.1)
H.S. Graduate	94.5 (±1.6)	79.2 (±3.0)	45.6 (±3.6)	27.4 (±3.3)
Some College	96.0 (±1.6)	76.7 (±3.8)	37.7 (±4.3)	36.5 (±4.3)
College Grad	95.0 (±2.2)	73.6 (±4.0)	28.2 (±4.1)	37.2 (±4.5)
Income				
< $10,000	93.9 (±2.7)	70.3 (±5.5)	56.7 (±6.3)	30.1 (±5.6)
$10,000-19,999	93.4 (±2.6)	81.9 (±3.8)	52.8 (±5.1)	29.7 (±4.8)
$20,000-34,999	94.5 (±2.1)	73.4 (±4.1)	40.8 (±4.5)	27.5 (±4.0)
$35,000-50,000	97.2 (±1.7)	78.7 (±4.1)	37.2 (±5.1)	29.9 (±4.7)
> $50,000	95.1 (±2.1)	77.4 (±4.3)	29.7 (±4.6)	40.9 (±5.0)

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[1] Proportion who responded "yes" to the question: "Do you think a pregnant woman who has the AIDS virus can give it to her baby?"

[2] Proportion who responded "yes" to the question: "Do you think a person can get infected with AIDS or the AIDS virus from being cared for by a nurse, doctor, dentist, or other health care worker who has the AIDS virus?"

[3] Proportion who responded "yes" to the question: "Do you think a person can get infected with AIDS or the AIDS virus from donating blood?"

[4] Proportion who responded "very effective" to the question: "How effective do you think using a condom is in preventing getting the AIDS virus through sexual activity?"

the donation of blood as a viable route of HIV transmission. Additional analyses of racial differences on this item were conducted that controlled for education. Racial differences on this item remained significant after controlling for educational attainment.

Abstaining from intercourse with infected partners remains the most effective strategy for preventing HIV infection associated with sexual activity. The use of latex condoms during intercourse, however, has been demonstrated to reduce the risk of HIV transmission. One item examined the extent to which respondents perceived condoms to be effective in preventing HIV transmission during sexual activity. Thirty-one percent of the respondents reported that they thought that condoms were a "very effective" method in preventing infection with the AIDS virus through sexual activity, 60.0 percent reported they thought condoms were "somewhat effective", 6.0 percent "not effective," and 2.7 percent did not know whether condoms were effective. Younger respondents and those with higher educational levels were significantly more likely to perceive condoms as "very effective". A significantly higher proportion of males thought condoms were "very effective" (33.7%) compared with females (28.7%). Those in the highest income category were significantly more likely to rate condoms as "very effective" compared to every other income group. There were also significant differences in the perceptions of condom effectiveness by the marital status of the respondents. A significantly higher proportion of unmarried respondents reported condoms as being "very effective" while married respondents were more likely to report condoms as being "somewhat effective" (Figure XI.1). A higher proportion of unmarried respondents reported that they did not know the effectiveness of condoms.

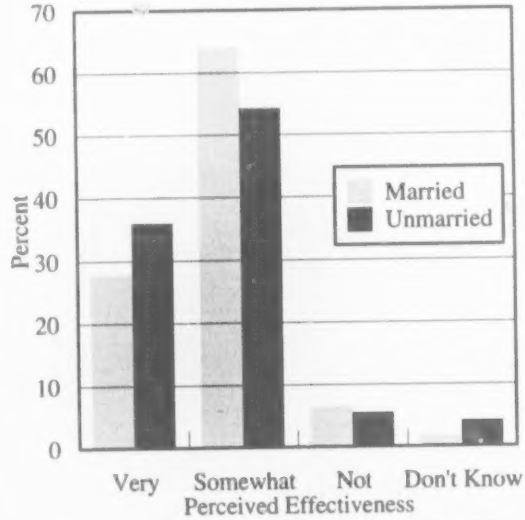
Figure XI.1
Perceptions of Condom Effectiveness
By Marital Status
Michigan BRFS, 1992

Results from three questions concerned with attitudes toward persons infected with the AIDS virus are presented in Table X1.2. A minority (30.6%) of the respondents reported that they would eat in a restaurant where the cook was infected with the AIDS virus; 3.1 percent reported that they did not know. The proportion responding "yes" to this question was inversely related to age (Figure XI.2) and directly related to income and education. College graduates were significantly more likely to respond "yes" compared to every other educational group. Whites were significantly more likely to respond "yes" (32.6%) to this item than African-Americans 18.5%). Additional analyses of racial differences on this item were conducted that controlled for education. Racial differences on this item remained significant after controlling for educational attainment.

TABLE XI.2

Attitudes Towards Persons With The AIDS Virus
BRFS 1992
(in percentages, with 95% confidence interval limits)

Demographic Characteristics	Infected Cook[1]		Infected Co-worker[2]		Infected Classmate[3]	
Total	30.6	(±2.1)	77.9	(±1.8)	87.6	(±2.7)
Age						
18-24	40.6	(±6.5)	82.4	(±5.2)	76.1	(±23.6)
25-34	39.3	(±4.3)	85.9	(±3.3)	87.4	(±4.3)
35-44	33.9	(±4.5)	85.7	(±3.6)	89.4	(±3.8)
45-54	29.2	(±5.3)	80.7	(±4.5)	84.8	(±9.3)
55-64	19.9	(±5.4)	71.2	(±5.9)	91.6	(±16.2)
65-74	14.4	(±4.0)	59.6	(±5.8)	0.0	(±0.0)
75 and Over	13.3	(±6.0)	44.7	(±8.8)	0.0	(±0.0)
Sex						
Male	28.4	(±3.0)	76.3	(±2.9)	88.9	(±3.8)
Female	32.6	(±2.7)	79.4	(±2.2)	86.4	(±3.8)
Race						
White	32.6	(±2.2)	79.2	(±1.9)	88.9	(±2.8)
African-American	18.5	(±5.4)	70.0	(±6.3)	81.8	(±8.9)
Education						
Less than H.S.	20.9	(±5.1)	62.1	(±5.4)	75.0	(±12.3)
H.S. Graduate	27.3	(±3.2)	76.2	(±3.1)	86.4	(±4.5)
Some College	31.0	(±4.1)	80.5	(±3.5)	90.2	(±4.7)
College Graduate	42.7	(±4.7)	88.7	(±2.9)	91.7	(±4.5)
Income						
< $10,000	28.2	(±5.8)	70.2	(±5.8)	87.5	(±8.6)
$10,000 - $19,999	26.2	(±4.4)	73.5	(±4.5)	85.2	(±8.0)
$20,000 - $34,999	31.9	(±4.0)	81.8	(±3.4)	86.0	(±5.8)
$35,000 - $50,000	33.2	(±4.7)	85.3	(±3.9)	88.7	(±5.7)
> $50,000	38.9	(±5.1)	85.0	(±3.7)	93.4	(±4.0)

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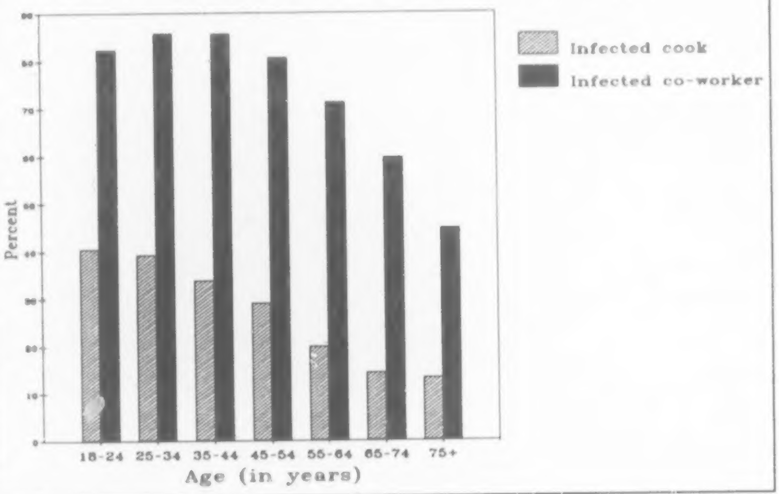
[1] Proportion who responded "yes" to the question: "Would you eat in a restaurant where the cook is infected with the AIDS virus?"

[2] Proportion who responded "yes" to the question: "Would you be willing to work with a person who is infected with the AIDS virus?"

[3] Proportion of parents with a child (children) in kindergarten through eighth grade who responded "yes" to the question: "Would you allow your child to be in the same classroom with a child who is infected with the AIDS virus?"

Figure XI.2
Proportion Reporting Favorable HIV-Related Attitudes by Age



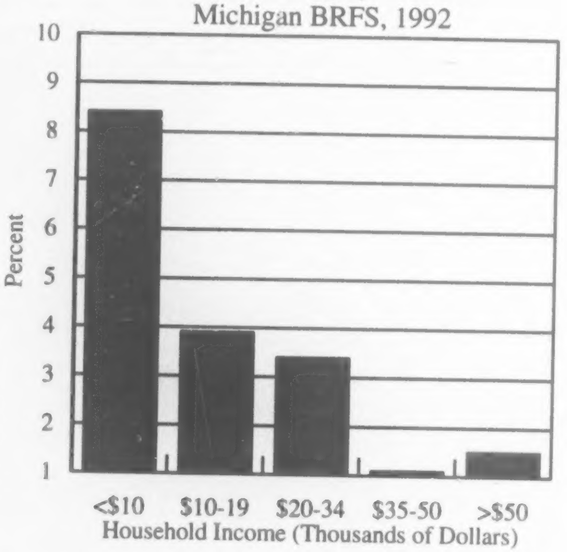
Over three-quarters of respondents (77.7%) reported that they would be willing to work with a person who is infected with the AIDS virus; only 3.4 percent reported that they did not know. Results from three questions concerned with attitudes toward persons infected with the AIDS virus are presented in Table XI.2. Younger respondents were more likely than older respondents to report a willingness to work with a person infected with the AIDS virus (Figure XI.2) and whites were more likely than African-Americans. Additional analyses of racial differences on this item were conducted that controlled for education. Racial differences on this item remained significant after controlling for educational attainment.

One-quarter (24.9%) of the respondents reported that they had at least one child in kindergarten through eighth grade. Among these parents, 87.3 percent reported that they would allow their child to be in the same classroom with a child who is infected with the AIDS virus, only 3.7 percent reported that they did not know. Nearly one-fifth (17.5%) of these parents reported that they thought AIDS education should start in kindergarten, and over 50 percent (51.8%) reported that they thought AIDS education should start by the fourth grade. Only a small percent (1.1%) of parents with children in these grades responded "never" to this item. There were no demographic differences for the responses to this item.

HIV counseling and testing are key elements in Michigan's HIV prevention efforts. One item examined respondents awareness of the availability of counseling and testing resources. All respondents were asked "where could you go to be tested for the AIDS virus infection?" A maximum of 2 responses were accepted. "Doctor or HMO" was the most commonly reported response (49.0% of the first responses; 74.0% total of the first and second responses), followed by hospital, health department, clinics, and other facilities. Only 4.0 percent reported that they did not know where they could go for an AIDS test, or that there was no where they could go. The proportion who did not know where to go or did not have anywhere to go was inversely related to income (Figure XI.3). Additionally, a significantly higher proportion of female respondents and those in the younger age categories and lower educational groups reported that they did not know where to go or did not have anywhere to go to be tested for the AIDS virus.

A toll-free AIDS information telephone hotline was established in 1984. In 1988, Michigan initiated a statewide HIV prevention media campaign. The hotline telephone number is included in all campaign advertising. Over half (55.1%) of all respondents reported that they had heard of a telephone hotline in Michigan that they could call to get more information about HIV and AIDS. Those who reported that they had heard of the hotline were asked where they had learned about it. The television was the primary response, while others reported learning about this number through the newspaper, radio, and posters.

Figure XI.3
Proportion Unaware of Where to Obtain AIDS Testing by Income
Michigan BRFS, 1992



TRENDS AND COMPARISONS

Results for several of the indicators of beliefs and knowledge about AIDS from the 1992 Michigan BRFS compared well with the results from all of the 48 states and the District of Columbia that participated in the 1992 BRFS. The proportion of respondents in Michigan who thought that there were drugs available which can lengthen the life of a person with AIDS (58.7%) was higher than the median proportion from the 48 states and the District of Columbia that participated in the 1992 BRFS (54.3%); the range was 40.4 to 65.0 percent. The proportion in Michigan who thought that condom use is "very effective" was slightly lower in Michigan than in most other states (Michigan 31.1%; US median 32.2%, range 15.6%-99.1%). A higher proportion of respondents in Michigan reported that they could go to the health department to be tested for the AIDS virus (12.7%) than reported this in most other states (US median 9.0%, range 1.2%-35.5%).[6]

Comparisons of responses for the Michigan 1992 BRFS with those in 1991 and 1990 revealed improvement in general knowledge about HIV and AIDS and increasingly favorable attitudes towards individuals with HIV and AIDS (Table XI.3). There was a significant decrease in the proportion of respondents answering "don't know" from 1991 to 1992 for the majority of items assessing general knowledge of HIV and AIDS. For example, in 1991, 23.9 percent of respondents reported "don't know" to the question asking if there were drugs available that could lengthen the life of a person infected with AIDS; only 7.4 percent of respondents reported "don't know" to this item in 1992. Comparison of the findings from the three most recent surveys revealed a steady decrease in the proportion of respondents who perceive condoms to be "very effective" in preventing HIV infection during sexual activity (42.4% in 1990; 35.0% in 1991; 31.0% in 1992) and a corresponding increase in the proportion of those reporting that they perceive condoms as "somewhat effective" (43.2% in 1990; 50.8% in 1991; 59.6% in 1992). An item assessing awareness of the availability of counseling and testing resources was first included on the 1990 survey. Findings from the 1992 survey suggest a steady increase among respondents in knowledge of where to go for HIV counseling and testing. In 1992, 4.0 percent of respondents reported that they did not know where to go or had no where to go to be tested for HIV compared with 9.0 percent in 1991 and 11.8 percent in 1990.

TABLE XI.3
Percent Responding "Yes" to Items Assessing
HIV-Related Knowledge and Attitudes
Michigan BRFS 1990-1992
(in percentages, with 95% confidence interval limits)

	1992	1991	1990
Heard the AIDS virus called HIV	98.2 (±0.6)	90.2 (±1.4)	79.1 (±1.9)
Drugs to lengthen infected person's life	58.7 (±2.2)	45.4 (±2.2)	47.6 (±2.2)
Infected person can look well and feel healthy	84.5 (±1.6)	72.1 (±1.9)	71.2 (±2.0)
Transmission via health care worker	76.6 (±2.0)	66.4 (±2.8)	**
Transmission from pregnant mother to baby	94.5 (±1.0)	90.0 (±1.4)	**
Transmission from donating blood	42.9 (±2.3)	40.0 (±2.3)	**
Eat in restaurant with infected cook	30.4 (±2.1)	23.4 (±1.9)	30.2 (±2.1)
Willing to work with infected co-worker	77.7 (±1.8)	70.0 (±2.0)	72.3 (±2.0)
Allow child to attend school with infected child	87.3 (±2.7)	76.7 (±3.7)	74.4 (±3.6)

** Item was not included in survey.

COMMENT

Previous surveys of HIV-related knowledge, attitudes and beliefs conducted in Michigan have suggested that Michigan residents are well informed about the viable routes of HIV transmission. Findings from surveys conducted in 1986, 1987, and 1988 suggested levels of knowledge regarding viable transmission routes approaching 100 percent accuracy.[7] Findings from the 1991 National Health Interview Survey (NHIS) have provided similar results at the national level.[8]

However, the findings of the current survey (1992 Michigan BRFS) also suggest that the general public in Michigan continue to hold misconceptions about HIV transmission. Over four of 10 BRFS respondents believed that transmission of HIV is possible via blood donation. This may reflect a misunderstanding of the question or of the process of blood donation. Fears of becoming infected with HIV through blood donation may discourage some individuals from giving blood.

The proportion of survey respondents who reported that they believe that HIV infection is possible through contact with infected health care workers increased between 1991 and 1992. Due to the structure of the question and associated response categories, the perceived likelihood of transmission from infected health care workers cannot be determined. While the possibility exists for transmission of HIV from provider to patient, the probability of such transmission is extremely low. It is important that the general media and public information campaigns provide the public with accurate information regarding the risk of infection in the context of health care encounters.

Nearly six of 10 respondents were aware that drugs are available which can lengthen the life of a person with HIV. This is an improvement over the findings from previous surveys. It is important, however, that continued efforts be made to increase awareness about treatments for HIV disease both in the general media and in public information efforts.

A majority of survey respondents believed condoms to be an effective means of preventing HIV transmission during sexual intercourse. It is important to note that a slight decrease was observed between 1991 and 1992 in the proportion of respondents who believed condoms to be "very effective" while the proportion of those who believed condoms to be "somewhat effective" or "not effective" increased. The effectiveness of condoms in preventing HIV transmission has been much debated in the local and national media as well as in various organizational activities and associated publications. It is possible that a lack of agreement from these sources of information has undermined public perception of condom effectiveness. Findings from the NHIS suggest that the public may not understand fully the information presented on condoms in the context of HIV prevention. The findings from that survey suggest that a majority of respondents do not know whether latex and membrane condoms afford equal protection from HIV infection. A majority of respondents also did not know whether oil-based lubricants caused condom breakage.[8] Michigan has and should continue to deal explicitly with the appropriate and proper use of condoms in all prevention activities and public information efforts. The CDC, through the National AIDS information and Education Program, will soon implement a national condom marketing campaign. The objectives of this campaign are twofold: 1) to increase understanding of condom efficacy and 2) to advocate consistent and correct condom use. It will be important to observe the impact that this campaign has on public perception of condom efficacy and general acceptability.

The findings of the current survey suggest that the attitudes of the general public toward those infected with HIV are becoming somewhat more favorable. However, much room for improvement exists. Less than one-third of all survey respondents reported that they would be willing to eat in a restaurant which employed a cook with HIV infection. This finding may reflect an underlying misconception regarding transmission of HIV. The proportion of respondents who reported a willingness to work with an infected person increased slightly compared with the past survey as did the proportion who reported that they would allow their children to attend school with an infected classmate. These findings suggest that prevention activities and public information efforts have been successful in correcting misinformation related to transmission via casual contact. Celebrity disclosures of HIV infection and associated media coverage may also contribute to more favorable attitudes towards those affected by HIV disease. Such disclosures raise awareness of HIV in general, stimulate information seeking behavior and foster a positive image of HIV infected people.[9,10,11,12]

In 1986, free and anonymous HIV antibody counseling and testing services became available in a few local health agencies in Michigan. By 1989, these services were available in all 50 local health agencies in Michigan as well as in a number of community-based organizations statewide. The availability of these services has been widely publicized in the Michigan public information campaign as well as in all prevention and education activities. The findings of the current survey suggest that these efforts have been successful in raising awareness among the general public in Michigan of the availability of HIV counseling and testing services.

The findings of this survey suggest that knowledge levels about viable modes of HIV transmission are generally high in Michigan. The findings do, however, point to remaining misconceptions which require further attention. Priority audiences include communities of color and those with lower levels of education. Educational efforts should stress correcting misconceptions about unfounded routes of HIV transmission and preventive behaviors. It is also important that prevention and education efforts address conflicting or misleading information presented by the media regarding modes of transmission and methods of prevention.

The HIV/AIDS Prevention and Intervention Section of the Michigan Department of Public Health conducts a variety of surveys of HIV-related knowledge, attitudes, and precautionary and risk behaviors among populations at risk for HIV infection. Findings from these surveys are used, in combination with data from other sources including disease surveillance, HIV seroprevalence, drug and alcohol abuse and treatment, and HIV counseling and testing, to develop educational programs and activities designed to promote a humane and rational social climate relative to HIV disease, to develop and refine prevention programs and to assure quality care for those affected by HIV disease.

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XII. SUMMARY

Ann P. Rafferty, Ph.D.

Multiple Risks

It was estimated from the BRFS that in 1992 only 18.4 percent of the Michigan adult population did not have any of the following risk factors for cardiovascular disease: cigarette smoking, high blood pressure (ever told), high blood cholesterol (ever told), physical inactivity (sedentary lifestyle), overweight, or diabetes (ever told).[a] Thirty-four percent (34.4%) of the population was estimated to have one of these important risk factors for cardiovascular disease, and for most of these people with one risk factor that risk factor was sedentary lifestyle. Twenty-seven percent (27.3%) of the survey respondents reported having two of these cardiovascular disease risk factors, 14.4 percent had three, 4.2 percent had four risk factors, and 1.3 percent had five or six of these CVD risk factors.

Prevalence rates for combinations of the three major CVD risk factors (smoking, ever told high blood pressure and ever told high cholesterol) are presented in Table XII.1 and have been tabulated by whether the respondent had ever had their cholesterol checked. Thirty percent (30.6%) of all respondents had none of the three major risk factors for CVD, i.e., they had had their cholesterol checked and had never been told that it was high, they had never been told that their blood pressure was high, and they did not currently smoke. On the other end of the risk spectrum, 1.5 percent had been told that their cholesterol was high, had been told that their blood pressure was high, and were current smokers. Another 1.1 percent had never had their cholesterol checked, had been told that their blood pressure was high, and were current smokers.

Health Insurance

The majority of respondents reported that they did have health insurance or other health care plan, however, 12.3 percent (±1.6%) reported that they had no health insurance or other care plan. Ninety percent of those with insurance reported that their plan covered all or most of hospital bills, 70.0 percent reported that their plan covered all or most visits to the doctor for illness, and 58.0 percent reported that their plan covered all or most preventive services. Combining responses to these three coverage questions, approximately half (48.9%) of the respondents with a health care plan reported that their plan covered all or most of the expense of hospital and doctor visits and preventive services. As would be expected, having a health care plan was related to the age, gender, education, and household income level of the respondent with older respondents, females, those with a college degree and those living in households with annual incomes of $20,000 or more were more likely to report having health insurance.

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[a] Five percent (5.4%±1.0) of the respondents reported that they had ever been told by a doctor that they had diabetes.

TABLE XII.1
Prevalence of Multiple Major Risks for Cardiovascular Disease
(Smoking, Ever Told High Blood Pressure, Ever Told High Cholesterol)
Michigan BRFS, 1992

Risk Combination[1,2]	Prevalence
Cholesterol Tested[3]	
HBP & Smoking & Cholesterol	1.5 (±0.5)
HBP & Smoking	2.4 (±0.7)
HBP & High Cholesterol	7.1 (±1.1)
Smoking & High Cholesterol	2.3 (±0.6)
HBP	8.5 (±1.2)
Smoking	9.6 (±1.4)
High Cholesterol	7.7 (±1.1)
None	30.6 (±2.0)
Cholesterol Never Tested	
HBP & Smoking	1.1 (±0.4)
HBP	2.6 (±0.7)
Smoking	8.5 (±1.3)
Neither	18.1 (±1.8)
Total	100.0

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[1] Risk combination categories are mutually exclusive. Prevalences may be summed columnwise.

[2] HBP = "ever told high blood pressure" as defined in the High Blood Pressure chapter.
Smoking = "current smoking status" as defined in the Cigarette Smoking chapter.
Cholesterol = respondent reported ever being told by a health professional that their blood cholesterol was high.

[3] Prevalence of multiple risks is presented separately for those who have and have not ever had their cholesterol checked.

Comparison with Other States

In comparison with results from all of the 48 states and the District of Columbia that participated in the 1992 BRFSS, it appears that the residents of Michigan continue to do well in terms of wearing safety belts, getting their cholesterol tested, and getting mammograms (Table XII.2). Results from the 1992 BRFS indicated that Michigan had the lowest proportion among all of the states that participated in the 1992 BRFS of women 40 years old and older who had never had a mammogram. However, the BRFS results also indicated that Michigan residents continued to be more likely to be risk takers when it came to smoking cigarettes, being overweight, and drinking alcohol than the residents of most other states.

Trends in Michigan

As reviewed in Table XII.3, annual prevalence estimates for several risk factors from the Michigan BRFS are now available over a six year period (1987-1992), and estimates for safety belt nonuse and smoking are also available for 1982. A trend analysis was performed using these data, where available consistently, to investigate whether there was evidence of linear change in

TABLE XII.2
Comparison of Michigan Prevalence Rates With Those from Other States Participating in the 1992 BRFSS

Health Risk	Prevalence in Michigan	State Level Prevalence[1,2]		
		Median	Range	Rank[3]
Safety Belt Nonuse	15.1 (±1.6)	19.3	4.0 - 51.6	38
Heavier Drinking	4.7 (±1.0)	2.9	1.7 - 6.8	8
Binge Drinking	18.6 (±1.8)	14.3	5.4 - 25.8	9
Drinking & Driving	3.8 (±0.8)	2.3	0.7 - 5.7	4
Overweight	29.2 (±2.0)	24.4	17.3 - 29.7	3
Sedentary Lifestyle	54.8 (±2.3)	56.5	46.2 - 82.1	30
Current Smoking	25.5 (±2.0)	22.9	15.7 - 30.7	10
Ever Told High BP	23.2 (±1.8)	20.7	14.7 - 27.9	8
Cholesterol Never Checked	29.7 (±2.1)	32.8	26.3 - 40.6	38
Never Had Mammogram[2,5] (among women 40 Years and over)	17.6 (±2.8)	26.0	17.7 - 42.7	49

[1] Source: Behavioral Surveillance Branch, Centers for Disease Control. 1992 BRFSS Summary Prevalence Report. Centers for Disease. Unpublished report.

[2] Methods of calculation may differ slightly from those used to calculate Michigan prevalence rates, however, the risk factor definitions are the same.

[3] Out of the 48 states and the District of Columbia that participated in the 1992 BRFSS. Rank 1 represents the highest risk. State ranks should be used with caution because of the variation in survey design, survey protocol, and response rates among states.

[4] State level prevalence calculated as 100 - prevalence from the CDC tables of ever having had cholesterol checked.

[5] State level prevalence calculated as 100 - prevalence from the CDC tables of ever having had a mammogram.

the prevalence of these behavioral risks in Michigan over time. Estimates of the slope for year and its significance level from linear regression analyses are presented in Table XII.4. These regression coefficient estimates for change by year indicate that there have been significant decreasing trends in safety belt nonuse, drinking and driving, and cholesterol never tested, an increasing trend in overweight, and no significant trend in sedentary lifestyle, smoking, high blood pressure (ever told high), and high cholesterol (ever told high).

Summary

Many of the patterns observed in the 1992 results by age and gender (Table XII.5) were similar to results from other years. The prevalence rates of safety belt nonuse and of alcohol risk behaviors by age sex groups followed a similar pattern. The highest prevalence rates were found among males 18-34 years, with males having higher prevalence rates than females, and younger persons of both sexes having higher prevalence rates than persons in older age groups. The prevalence rates of overweight and high blood pressure were both age-related as well, in that they both tended to increase with age.

The risk from being overweight continues to be of particular concern in Michigan. The prevalence of overweight in Michigan has for the past several years been very near the high end of the distribution of overweight prevalence rates for all the BRFSS participating states. Not only is the prevalence of overweight high in Michigan compared with other states, the prevalence of overweight in Michigan appears to be increasing. The increasing trend that has been observed for overweight in the annual Michigan BRFS data was substantiated by the linear trend analysis.

TABLE XII.3

Prevalence of Selected Risk Factors
Michigan Behavioral Risk Factor Surveys, 1982 and 1987 - 1992[1]

Risk Factor[2]	1982	1987	1988	1989	1990	1991	1992
Safety Belt Nonuse	73.7(±2.4)	24.6(±1.9)	23.3(±2.5)	20.6(±2.0)	21.1(±1.9)	18.9(±1.8)	15.1(±1.6)
Alcohol Use							
Heavy Drinking[3]	{7.5(±1.5)}	{8.8(±1.3)}	{10.5(±1.8)}	{6.4(±1.2)}	4.5(±1.0)	4.9(±1.1)	4.7(±1.0)
Binge Drinking		22.5(±1.9)	24.3(±2.5)	19.5(±2.0)	17.9(±1.8)	18.3(±1.9)	18.6(±1.8)
Drinking & Driving		7.2(±1.2)	5.4(±1.3)	4.6(±1.0)	3.3(±0.8)	4.2(±0.9)	3.8(±0.8)
Overweight		22.7(±1.9)	23.5(±2.5)	26.2(±2.1)	26.5(±2.0)	29.4(±2.1)	29.2(±2.0)
Sedentary			54.3(±2.9)	60.3(±2.2)	57.4(±2.2)	55.3(±2.4)	54.8(±2.3)
Smoking	32.4(±2.6)	28.9(±2.0)	26.7(±2.6)	28.3(±2.0)	29.2(±2.0)	27.9(±2.0)	25.5(±2.0)
Ever Told High Blood Pressure			23.3(±2.0)	23.3(±1.8)	24.1(±1.9)	23.2(±1.8)	
Cholesterol							
Never Tested			42.1(±2.9)	38.2(±2.4)	34.2(±2.2)	30.0(±2.1)	29.7(±2.1)
Told High[4]			26.9(±2.6)	28.8(±2.7)	27.0(±2.3)	31.5(±2.4)	26.8(±2.3)

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[1] The 1982 BRFS was a point-in-time survey conducted in June-July 1982; N=1492. The 1987 BRFS was conducted from October 1986 through September 1987, with 200 interviews completed per month. The 1988 BRFS was conducted from June through December 1988, with approximately 140 interviews conducted in June and 200 each month during July through December. The 1989, 1990, 1991, and 1992 BRFS were conducted throughout their respective calendar years, with 200 interviews conducted monthly.

[2] All risk factor definitions are the same as discussed in the individual chapters except for the following. Safety belt nonuse = Sometimes, seldom, or never.

[3] Based on average weekly consumption of 14 or more drinks in 1982 and 1987-1989 and changed to average consumption of 60 or more drinks per month in 1990. This represented a change in calculation of heavy drinking prevalence, not in the survey questions. { }Risk definition differs from others in the same row; prevalence figures may not be comparable.

[4] Proportion among those who have had their cholesterol tested.

TABLE XII.4
Test for Trends in Behavioral Risk Prevalences -
Regression Coefficients and Significance Levels

Health Risk	Slope[1]	P[2]
Safety Belt Nonuse[3]	-1.72	.0029
Drinking & Driving[3]	-0.63	.0372
Cholesterol Never Tested[4]	-3.30	.0044
Overweight[3]	+1.44	.0015
Binge Drinking[3]	-1.12	.0555
Sedentary Lifestyle[4]	-0.40	.6775
Current Smoking[3]	-0.36	.3417
Ever Told High BP[5]	+0.05	.8461
High Cholesterol[4] (ever told high)	+0.30	.7113

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[1] Regression coefficient for year in model: Risk = $\beta_0 + \beta_1(\text{Year}) + \varepsilon$.
[2] P value for t-test of hypothesis $\beta=0$. $P<=.05$ was considered significant.
[3] Data available from 1987-1992.
[4] Data available from 1988-1992.
[5] Data available from 1989-1992.

TABLE XII.5

Health Risk Behaviors by Age Sex Groups
Michigan BRFS, 1992
(in percentages, with 95% confidence interval limits)

Health Risk Behavior[1]	TOTAL	18-34 years		35-54 years		55+ years	
		Males	Females	Males	Females	Males	Females
Sa[illegible] belt Nonuse[2]	15.1(±1.6)	29.9(±5.0)	13.6(±3.6)	17.1(±4.2)	7.9(±2.5)	10.5(±3.7)	8.6(±3.0)
Alcohol							
Heavy	4.7(±1.0)	10.1(±3.5)	0.6(±0.6)	9.5(±3.1)	1.7(±1.2)	5.4(±2.7)	0.9(±0.9)
Binge	18.6(±1.8)	40.8(±5.5)	17.1(±3.9)	24.9(±4.6)	7.3(±2.4)	14.5(±4.6)	3.0(±1.8)
Drink & drive	3.8(±0.8)	7.1(±2.6)	5.0(±2.3)	5.0(±2.1)	0.8(±0.8)	4.1(±2.7)	0.0(±0.0)
Overweight	29.2(±2.0)	23.0(±4.7)	19.2(±4.0)	38.3(±5.3)	28.5(±4.6)	34.5(±6.1)	35.1(±4.9)
Sedentary	54.8(±2.3)	53.7(±5.7)	60.5(±5.1)	55.0(±5.4)	49.0(±4.9)	54.5(±6.7)	55.8(±4.7)
Smoking	25.5(±2.0)	28.2(±5.0)	29.3(±4.8)	29.6(±5.0)	26.8(±4.3)	17.7(±4.8)	17.6(±3.9)
Ever Told HBP	23.2(±1.8)	9.4(±3.2)	10.8(±3.1)	27.5(±4.8)	17.5(±3.9)	41.8(±6.4)	41.9(±5.0)
No Chol. Test	29.7(±2.1)	54.0(±5.6)	46.4(±5.1)	22.0(±4.4)	20.5(±4.1)	12.0(±4.3)	12.4(±3.3)
Chol. Told High[3]	26.8(±2.3)	13.8(±5.2)	14.1(±4.7)	28.3(±5.4)	23.2(±4.7)	34.5(±6.4)	40.7(±5.4)

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[1] All risk factor definitions are the same as discussed in the individual chapters except where noted.

[2] Reported sometimes, seldom, or never wore safety belts.

[3] Proportion among those who had had their cholesterol tested.